RADFORD LIBRARY,

Saint Mary's Hospital, Manchester.

No. *617*

This Book to be returned in   *days.*

Fine for overtime____per day.

THE

DUBLIN QUARTERLY JOURNAL

OF

MEDICAL SCIENCE.

VOL. LII.
AUGUST AND NOVEMBER, 1871.

THE

DUBLIN QUARTERLY JOURNAL

OF

MEDICAL SCIENCE.

CONTENTS.

No. CIII.—AUGUST 1, 1871.

Part III.—QUARTERLY REPORTS.

Part IV.—MEDICAL MISCELLANY.

THE

DUBLIN QUARTERLY JOURNAL

OF

MEDICAL SCIENCE.

CONTENTS.

No. CIV.—NOVEMBER 1, 1871.

Part I.—ORIGINAL COMMUNICATIONS.

Part III.—QUARTERLY REPORTS.

Report on Medicine.   By James Cuming, M.A., M.D. :—

PART IV.—MEDICAL MISCELLANY.

NOTICES TO CORRESPONDENTS.

We have been obliged to hold over several Original Communications, Reviews, and Clinical Records.

Authors of Communications are requested to write the prescriptions in their papers in full, and in English.

Books and Periodicals published in Northern Europe and the German States intended for our Journal, should be transmitted "For the Editor of the Dublin Quarterly Journal of Medical Science, care of Messrs. TRUBNER and Co., *London*," *through the following Houses, viz. :*—Messrs. SCHNEIDER and Co., *Berlin ;* Messrs. BRAUMULLER and SON, *Vienna ;* M. F. A. BROCKHAUS, *Leipzig ; and also their Correspondents* in the principal Towns on the Continent. Our Correspondents in France, Belgium, Italy, and Spain, are requested to communicate with us through " Messrs. HACHETTE and Co., 77, *Boulevard St. Germain, Paris.*"

AMERICAN Books and Journals often come to hand with such an amount of Charges on them, that we cannot release them. It is requested that *all* communications from the United States shall be forwarded to MR. JOHN WILEY, *New York ;* or Mr. HENRY C. LEA *Philadelphia*, directed to us, to the care of Messrs. TRUBNER and Co., *London.*

PART I.

ORIGINAL COMMUNICATIONS.

———◆———

ART. I.—*The Dependency of Life on Disorganization.* By
HENRY FREKE, M.D., Univ. Dub., M.R.I A.; Fellow and
Ex-Vice-President, Censor and Examiner in Medicine, King
and Queen's College of Physicians, Ireland; Senior Physician
to Dr. Steevens' Hospital, Dublin; Physician to Swift's Lunatic
Asylum; Professor of the Practice of Physic, and Lecturer on
Clinical Medicine in Steevens' Hospital Medical College, &c., &c.

[Concluded from Vol. LI., p. 280.]

> "The fundamental inquiries in physiology ever must be into the
> nature of life and its relation to death. I have attempted to
> point out what I regard as the nature of life, and have defined
> living to be—the act of being elevated in the scale of organiza-
> tion. . . . . . I have endeavoured to show what I conceive
> to be the nature of death and its relation to life, pointing to the
> nature of the essential dependency of the latter upon the former."
> —H. FREKE, in *Medical Times* (London), 3rd February, 1849,
> Vol. xix., page 296.

In his criticisms on the letter of Mr. Hinton, Dr. Watters does
not confine his argument to simple reasoning from analogy, but
further has recourse to so formidable an engine as—*parody.*

In my former communication I gave a specimen of Dr. Watters' mode of reasoning analogically—I shall now give a sample of that gentleman's parodying capabilities.

Dr. Watters quotes in full the passage from my publication of 1848, partially quoted by Mr. Hinton. It is as follows:—

" Death is essentially a part of life. It is the transit of the organizing influence from the organizing atom which causes that atom's death. It is the transit of the same organizing influence to that atom's type which gives to that type its life. But it is *during*, and alone during such transit, that conjointly the two atoms live. Abandoned by the organizing influence, the elements of the old atom, now unfettered by opposing forces, become amenable to inert matter's laws—in a word, become inert; and this it is which constitutes its death. Controlled by the same organizing influence, the elements of the new atom assume the organized condition; in a word, become possessed of and adapted for imparting life; and this it is which constitutes it an organizing atom; that is what gives it life. But as it is while, and only *while*, the parent atom is resigning that influence which caused it to be an organizing agent, that such atom can be said to be dying; so it is while, and alone *while*, the offspring atom is receiving the same organizing influence, that it can be said to be living: and thus are two essentially distinct and opposite processes, of necessity, concerned in producing the phenomena of active life; are, of necessity, in operation for the production of what we imply when we say of a thing, ' it *lives ;*' and thus, too, becomes apparent how death is essentially a part of life, how ' in the midst of life we are in death.' "—*Freke*, 1848, p. 45.

In this passage I had been attempting to explain *how* the germ of " the simplest conceivable vegetation " reproduces a similar simple germ. This simplest of germs I termed an " organizing atom," an expression somewhat corresponding—if I be not incor· rect—with the recently introduced term " microzyme." *The way* in which this simplest of germs reproduces a germ similar to itself is, as I attempted to point out, by *itself* undergoing the process of decomposition, disorganization and *death*. Hence *my* idea of " the dependency of life upon death."

In his criticisms of the foregoing quotations from my publication of 1848, Dr. Watters observes as follows:—

" This claim of identity instituted by Mr. Hinton appears so farcically absurd that serious argument would seem inappropriate.

To adapt myself to the occasion, therefore, I will even resort to parody, in order to point out the *difference* in the most glaring light. If one were to attempt to explain the phenomena of the clock in the same mystical manner, he would say : The downward movement of the weights is essentially a part of clock movement. It is the *transit* of the time-keeping influence from the weights which *causes* the weights to descend. It is the *transit* of the same time-keeping influence to the clock which gives to that clock its time-keeping property. But it is *during*, and alone during such transit, that conjointly the two keep time. *Abandoned* by the time-keeping influence, the elements of the raised weights, *now unfettered by opposing forces*, become amenable to inert matter's laws—in a word, become inert; and this it is which constitutes their downward movement. *Controlled* by the same time-keeping influence, the elements of the clock assume time-indicating relations—in a word, become possessed of and adapted for imparting the time of the day; and this it is which constitutes it a time-keeping instrument—this is what gives it time-keeping properties. But as it is while, and only while, the raised weights are resigning that influence which caused them to be a time-indicating agent, that such weights can be said to be descending : so it is while, and alone *while*, the clock is receiving the same time-keeping influence can it be said to be keeping time; and thus are two essentially distinct and opposite processes, of necessity, concerned in producing the phenomena of active keeping time ; are, of necessity, in operation for the production of what we imply when we say of a thing, it keeps time; and thus, too, it becomes apparent how the downward movements of the weights are essentially a part of the time-keeping process, how in the midst of time-keeping the weights are descending."

Dr. Watters, no doubt, considers the foregoing highly absurd; but I shall endeavour to convince Dr. Watters—and that without either parody or satire—that it is not, perhaps, quite so absurd as he imagines, and that whatever there may be of absurdity in it is altogether of Dr. Watters' own making and not mine.

I shall endeavour to convince Dr. Watters that the absurdity results from his having instituted an erroneous analogy, and confounded two things altogether distinct in their nature—namely, the phenomena of *organic* life and the phenomena of *animal* life.

It will be borne in mind that while the quotations from my publication have relation exclusively to the phenomena of organic

life—viz., the life manifested by "the simplest conceivable vegetation," Dr. Watters applies those observations derisively to phenomena analogous to those of animal life, with which they have no analogy whatever.   Hence the absurdity is altogether of Dr. Watters' making, not mine.

Dr. Watters applies to the *downward* movement of the weights of a clock—(viz.: a phenomenon analogous to *animal* life)—observations of mine which referred exclusively to the *upward* movement of matter in the scale of organization, viz.:—phenomena of *organic* life.   Dr. Watters thus attempts to cast ridicule on my views, by applying observations of mine to a subject to which they had no relation whatever.

I shall divide Dr. Watters' parody—as I did his analogy—into its individual statements, and point out how, in most of those statements, my observations have been misapplied.   Dr. Watters' statements chiefly apply to " the keeping of time," while the quotations from my publication can be only applicable to the making and winding of the clock.

DR. WATTERS.	DR. FREKE.
1. It is the " transit " of the time keeping influence from the weights which causes the weight's descent.	1. It is the communication of the raising force *to* the weights which causes the weight's *ascent* (and—I may add—it is the withdrawal or " *transit* " of that force from the weights that admits of their descent).
2. It is the " transit " of the same time-keeping influence to the clock which gave to that clock its time-keeping property.	2. It is the transit or application of the force which raises the weights, which enables the clock to keep time.
3. But it is during and alone during such transit that conjointly the two keep time.	3. It is during and alone during the transit—or application—of the force which raises the weights that conjointly the two—viz.: the clock plus the force which is raising the weights—are acquiring the capability to indicate time.
4. Abandoned by the time-keeping influence, the elements of the raised weights, *now unfettered by*	4. Though having no relation to my statement, I may say—abandoned by the force which raised

opposing forces become amenable to inert matters' laws—in a word become inert—and this it is which constitutes their downward movement.

5. *Controlled* by the same time-keeping influence the elements of the clock assume time-indicating relations ; in a word, become possessed of and adapted for imparting the time of the day ; and this it is which constitutes it a time-keeping instrument—this is what gives it time-keeping properties.

6. But as it is while, and only while, the raised weights are re-signing that influence which caused them to be a time-indicating agent, that such weights can be said to be descending ; so it is while and alone *while* the clock is receiving the same time-keeping influence, can it be said to be keeping time ?

7. And thus are two essentially distinct and opposite processes of necessity concerned in the phenomena of active time-keeping, are of necessity in operation for the production of what we imply when we say of a thing it keeps time.

the weights, those weights now unfettered by opposing forces (viz. : gravity and the force that raised them), become amenable to the laws of gravity, and this it is which admits of their downward movement.

5. Controlled by the force which raised the weights the clock is now competent to indicate time—in a word is adapted for imparting the time of the day—and this it is which constitutes it an instrument competent to indicate time—this it is which gives it time-keeping properties.

6. But as it is while, and only while the raised weights are resigning, the force or "potential energy" which enabled them to aid in the indication of time, they are descending ; so it is while and alone while the weights are receiving that force or " potential energy," the clock is becoming competent to indicate time.

7. " Keeping time " can only—as I have pointed out—be regarded as analogous to phenomena of *animal* life, and my observation, here parodied, applied exclusively to phenomena of *organic* life. However I may add—if " keeping time " be said to be analogous in any way to *life*, it is to *animal* life, and the clock while manifesting that life—namely, while keeping time is *parting* with its *organic* life—namely, is resigning its time-keeping capabilities, and consequently is *dying.* Hence two essentially distinct and opposite processes are of necessity in operation during time-keeping—

viz. : the time-keeping *life* and the *dying* clock. [a]

8. And thus too it becomes apparent, how the downward movements of the weights are essentially a part of the time-keeping process, how in the midst of time-keeping the weights are descending.

8. Does Dr. Watters doubt or question this fact? If not—(although in no way related to the passage in my publication referred to)—why does he attempt to hold it up to derision?

From the foregoing analysis it is, I think, apparent that—even notwithstanding the misapplication of my writings—Dr. Watters' parody on the passage he quotes from my publication does not prove that passage after all to be so very farcically absurd, as to Dr. Watters it doubtless appears. It is, I think, further obvious that whatever of absurdity really is to be recognized in Dr. Watters' parody, such absurdity is not chargeable to my account, but is altogether the result of Dr. Watters' own errors.

Dr. Watters' second analogy is between vital phenomena and the motions of a lever. Upon this subject Dr. Watters expresses himself thus :—

" I mean to say universally, that reaction is equal and opposite to action and logically *consequent*—that while the motions of the two ends of the lever are synchronous, yet, if moved by weights, the downward movement is the logical antecedent, and the upward movement, the logical consequent. There is no 'agency' or 'influence' to resist the downward movement of the long end,

[a] The above is an instance of the apparent paradox referred to in my former communication, viz.—Vol. li., page 274. The term *Life* is used in the above passage in two different significations ; namely, it is employed to express the immaterial phenomenon—the *indicating* of *time ;* and is also used to signify the constructive life of the clock. Whereas *death* in that passage means organic death or *disorganization,* analogous to the running down of a clock. We know that as time is being indicated —(or as *animal life* is being manifested)—the weights of the clock are descending ; the clock is going down ; it is parting with its organization ; it is losing its organic life ; in a word—*it is dying.* " And thus are two essentially distinct and opposite processes of necessity concerned in the phenomena of active time-keeping, are of necessity in operation for the production of what we imply when we say of a thing it keeps time." The one of those processes being—*the indicating of time ;* a process analogous to the phenomena of *animal* life, such as thinking ; the other of those processes being—*the running down of the clock ;* a process of organic *dying.*

The apparent paradox here is in reality *only apparent* and not real. It results simply from the fact that the same word " *life* " or " *living* " is applied to two perfectly distinct classes of phenomena. To Dr. Watters, however, who believes in " *the dependence of life on decomposition,* " there cannot possibly be anything paradoxical in the above.

but through the adjustment, gravity at one end is resisted by gravity at the other, and though the directions of the motions of the two ends are opposite, yet gravity is the common motor. Though there is a 'lever principle,' or principle of the lever, yet there is no lever 'agency' or 'influence' which 'radiates' from the long end and thus leaves it amenable to the laws of gravity; the short end of the lever is not a 'reciprocal' or specific 'stimulus' to call into 'active operation' the lever 'agency or influence.'"

For reasons, it would occupy too much space at present to go into, it appears to me that even less real analogy is to be recognized, between vital phenomena and the action of a lever than between such phenomena and the constructing and working of a clock. However we must take things as we find them and analyse the matter before us as it is.

In this analogy are to be recognized identically the same errors as those pointed out in relation to that of the clock; namely, 1st, Dr. Watters ignores organic or constructive life as constituting any part of the (so to speak) life of the lever; substituting in place thereof the word "adjustment," as though adjustment constituted no part of the life of an organic being; while it is to this very adjustment, &c.,—viz., to organic or constructive life—the passages quoted from my publication exclusively referred; and 2ndly, Dr. Watters' attempts to burlesque my writings by himself instituting an erroneous analogy, in which he contrasts phenomena that are in no way analogous.

Let us, however, proceed to our analysis.

The lever—like the clock—must have some function to perform, and, like the clock, must have been constructed and adjusted before it can perform that function, whatever it be. Consequently, in the language of analogy, the lever—like the clock—may be said to have its two lives: namely, an *organic* life for its construction and adjustment; and a—so to speak—*animal* life of working; namely, a life of functional activity.

In the—so to speak—organic life of the lever—in like manner as in that of the clock—are to be recognized two distinct stages, viz., 1st, the construction of the lever out of raw materials—(analogous to the formation of albumen and to the manufacturing of the clock); 2ndly, the adjustment or adaptation of that lever, when constructed, to the function for which it is designed—(analogous to the conversion of albumen into brain and to the *winding* of the clock).[a]

[a] When I stated in my former communication that albumen is raised to the

In the present instance the *raising* of the long arm in opposition
to gravity is the adjustment or adaptation to function, inasmuch as
the *descent* of the long arm is the function referred to in Dr.
Watters' analogy.

Thus then to recapitulate.

In the first place a lever of the first kind, and with unequal arms
is *constructed*. This constructing constitutes the first stage of its
—so to speak—*organic* life. In the second place, this lever is
adjusted to its function—namely, the long arm is raised by some
force antagonistic of gravity ; this raising of the long arm in oppo-
sition to gravity, namely, the adjustment, constitutes the second
stage of the lever's—so to speak—organic life.

When the long arm has reached its greatest elevation the, so to
speak, organic life of the lever is completed.   The lever is now *at*

more highly organized condition of brain, I did not, of course, mean to convey
that albumen, exclusively and alone, is directly converted into cerebral matter.
What I did mean to express is this. Every one is aware that an egg is com-
posed exclusively of albumen and oil, with a small percentage of mineral elements.
Every one is further aware that out of this albumen, oil, and mineral elements,
the *brain* of the chicken, as well as its other organic tissues, is, in some way
or other, developed. Now what I submit is this—namely, that the development
of brain out of albumen, oil, and mineral elements, is effected, whether directly
in having passed through some intermediate stages matters not at present, that
the development, I say, of brain out of these components is effected through the
agency of a so-termed "organizing atom" or the germ of the cerebral cell, which
organizing atom or germ acting on these components—namely, on the "specific
stimulus" of such organizing atom—elevates those components in the scale of organiza-
tion, and thus converts them into cerebral matter or brain. When treating on this
subject in 1851, I thus expressed myself in the Dublin Medical Press :—" There are
several physiological phenomena which make it apparent that certain organizing atoms
require, for the discharge of their physiological function of conferring organization, the
presence of what I would call a *compound* residual product. What I mean to express
by the term compound residual product is this—namely, an organized mass which has
been formed by the combination of two or more residual products generated either by
different species of organizing atom, or by different varieties of the same species.
Thus, for example, a combination of fibrin with a peculiar species of fatty matter
would form a *compound* residual product, inasmuch as these two components have
derived their origin from different sources. What I now state is, that several physio-
logical phenomena make it apparent that certain organizing atoms require the presence
of some such compound residual product to call them to the *normal* discharge of their
function. Thus, for the sake of illustration, I shall suppose that a combination
of fibrin with a peculiar species of fatty matter is essential to call into *normal* operation
the action of the atom whose function is to form nervous tissue."—Dub. Med. Press,
17th September, 1851, p. 179. The physiological relations of fibrin are not now
supposed to be what they were believed to be when I wrote the foregoing. Fibrin was
then pretty generally believed to contribute to the formation of the higher organic
tissues.

rest, and there is no motion of either arm. All action subsequently to this must pertain to its function, namely, in the language of analogy, to its, so to speak, *animal* life. Its function is the descent of the long arm. How is that functional action—(viz., the *descent* of the long arm)—*caused* to commence? By the *withdrawal* from the long arm of the force which raised it in opposition to gravity. Mark then the "logical antecedent" to *all* motion of the adjusted lever is the withdrawal of the hand or other force, which raised the long arm in opposition to gravity. Of this I shall presently endeavour to convince Dr. Watters.

As all the factors in these two so-called lives of the lever are in all respects analogous to those already referred to in the clock, it is needless to weary the reader with their repetition. It will be sufficient to observe as follows, viz.:—

1st, The long arm of the lever could have no "downward movement," unless it had previously attained an upward position.

2nd, It is only through the agency of a force opposed to or antagonistic of gravity that such upward position could be attained; and

3rdly, The "downward movement" cannot commence till the force which raised the long arm in opposition to gravity be *withdrawn* from acting on that long arm. In a word till the balance between the opposing forces—viz., gravity and the force which raised the long arm has been disturbed there can be no motion in either direction. Till this balance of opposing forces is disturbed everything is at rest, no motion of any kind can take place. Disturb this balance and motion at once commences. How can a disturbance of this balance be effected? That is to say how can the equilibrum between the two opposing forces—gravity and the raising force—be disturbed in the adjusted lever so as to admit of the motion of the arms of that lever from their previous state of *rest?* For the state of *rest* could only be maintained by maintaining the balance between those opposing forces.

The disturbance of that equilibrium is effected by simply *withdrawing* from the long arm the force which raised it, and thus leaving it "amenable to the laws of gravity." If that long arm has been raised by the hand of man, that hand must be *removed* before the long arm can descend.

The long arm then "unfettered by opposing forces"—viz., gravity and muscular force—becomes "amenable to the laws of gravity."

Or to take another example—suppose the arms of the lever to be equal and balanced—a pair of scales for instance.

Here after the adjustment there is no motion whatever notwithstanding the action of gravity.

Why? Simply because gravity is antagonized or resisted by the force which raised the two arms, or—which is the same thing—by the resistance of the fulcrum which now represents the raising force, and consequently these two opposing forces— gravity and raising force or fulcrum resistance—balancing each other's action— keep the two arms *at rest*.

Disturb this balance and the result must be motion. How is this disturbance effected? In either of two ways—namely, either by *withdrawing* the raising force or by *increasing* the force of gravity at one side. How is this disturbance effected? In either of two ways—viz., either,

1st, By withdrawing the raising force—(viz., removing the fulcrum)—and then gravity being now unfettered by opposing force—(viz., the fulcrum resistance)—the two arms " become amenable to the laws of gravity" and descend; or

2ndly, By increasing gravity on one side[a] by adding to it some weight.

How is this latter effected? It can only be effected by raising matter in opposition to gravity. No weight can be added to one side of the balance, unless it be raised by some force (muscular or other) antagonistic of gravity and the raising force— say the hand which puts the weight into the scales must be *withdrawn* from acting on that weight before the balance can be disturbed.

When the hand has been withdrawn from acting on the weight, that weight, now " unfettered by opposing forces, becomes amenable to the laws of gravity," and descends.

I would ask Dr. Watters' assent to the following statements:—

1st. No body upon which gravity is acting—(say the raised weights of a clock)—can be *at rest*, unless it be also acted on simultaneously by some other force opposing or antagonizing gravity. It is the *joint action* of the two opposing forces that keeps that body at *rest*. Will Dr. Watters refuse his assent to that proposition?

2nd. No body upon which gravity is acting can be *put in motion* from a state of *rest*—(say the weights of a clock begin to descend)—unless by a disturbance of the balance of equilibrium between gravity and the force opposing gravity—(say the force which

---

[a] Or, which amounts to the same thing, diminishing gravity at the other side.

raised the weights)—which equilibrium between these opposing forces kept the body at rest. Will Dr. Watters refuse his assent to that proposition?

Now, how is a disturbance of the equilibrium between these two opposing forces effected? In either or both of two ways, viz.:—

Either by increasing the force of gravity, or by diminishing the raising force—or perhaps most efficiently by both. This is obviously true whether applied to the weights of a clock, to the arms of a lever, or to *any* mechanical contrivance whatever, in which the force which effects the motion is gravity. Will Dr. Watters refuse his assent to that proposition?

I would have supposed that anyone familiar with the veriest rudiments of science would unhesitatingly assent to the truth of each of the foregoing statements, and yet—as I have attempted to point out—Dr. Watters strenuously protests against all three.

Now what I maintained in 1848, was this—namely, that the very same laws are true of *vital* as well as of mechanical motions. That the molecular motions which are constant during vital manifestations can alone be effected by a disturbance of the balanced equilibrium between the " organizing agency" and chemical force; which balanced equilibrium had hitherto kept the molecules of the *organic* structure *at rest.* But how is a disturbance of the equilibrium between *those* two opposing forces to be effected?— that is between the forces in the organic structure which keep tis molecules *at rest.*

In either or both of two ways, viz.:—either by increasing the chemical force; or by diminishing the organizing force—or perhaps most efficiently by both. In my publication of 1848, I thus express myself on this subject:—

" Among the earliest of the phenomena which arrest the attention of an inquirer into physiological operations, is the condition of motion in matter, with which he finds himself to be everywhere encountered; and recognizing therein an effect of some operative agent, he feels it incumbent on him to endeavour to trace observed results to their cause. In the inanimate world, the natural philosopher, having learned that ponderable matter has been endowed with no inherent power of motion, and at the same time perceiving that such matter moves, has been taught to inquire for inert matter's mover, and to this, whether ascertained or undiscerned, he has applied the term Force. Some agency, research has convinced him, is essentially in operation for the production of every

existent motion in inert matter.   Some agency is equally essential to stay that motion—once produced.   To all such agencies—alike to the originators and stayers of motion—he has applied the term Force.

" So, too, in the living world, the physiologist regards it as of necessity appertaining to his province to inquire into the cause of those motions and resistances which he finds to be essentially and peculiarly vital.   But as his intercourse with vital operations becomes more and more extended, he soon learns that his mind can form no idea derived from observation regarding vital activity, which is not essentially associated with that of matter in motion. His experience of living matter points to molecular movements as an inseparable, an indispensably essential attendant thereon.   The moment matter lives, he sees its elements in motion; this motion he sees continuous while the matter is living; and when the elements cease to move, the matter no longer manifests life."— *Freke on Organization,* 1848, pp. 20–21.

In relation to the *cause* of the disturbance of the equilibrium between the organizing agency and chemical force—which disturbance originates the molecular motions of life—I submitted the following question and answer—" But how can the organized condition of the organizing atoms be destroyed?   Obviously, by either increasing the chemical or diminishing the organizing force, ro perhaps most efficiently by both."—*Freke on Organization,* 1848, p. 39.

The chemical force—as I pointed out—is increased by the action of oxygen on one of the highly oxidizable metals which forms a component of the organic structures, as also by heat and moisture, and simultaneously therewith the organizing agency radiating its influence—like its analogue heat—upon other materials elevates those other materials in the scale of organization; while in doing so the organizing agent or atom itself becomes reduced to the condition of a chemical compound.   Hence *my* idea of—" The dependency of life upon disorganization."[a]

<hr />

[a] In my publication of 1848, I expressed myself as follows on the above topics:— " In what way could the chemical force be more effectually augmented, than by presenting to the atom a chemical agent, which had for some of its constituents an extraordinary affinity ?   That chemical agent we have already seen in oxygen gas, and the constituent of the organizing atom is the alkaliginous metal.   And in what way could the organizing agent be more effectually diminished, or, which is the same thing, withdrawn from the atom, than by presenting to such atom that which is capable of involving it in, as it were, reciprocal or interchanging action; in a word, presenting to

Dr. Watters tells us—" The seed does not possess vitality in any sense of the word, before germination; it does not even possess *life force* either dormant or in action." What then does it possess? Surely it possesses *something* which distinguishes it from the chemical compound carbonate of ammonia. It is possessed—to use the most recent expression—of " *potential energy*." It is possessed of *organization*. Where did it obtain this potential energy and this organization?

Were they not " *imparted* " to it by its parent seed, and will it not again " *impart* " them to its offspring?

And will it not in " *imparting* " that organization and potential

it its own specific or appropriate stimulus? But what that stimulus is, we shall now proceed to inquire. What, we would ask, are the conditions found most favourable for effecting chemical union? One we have seen to be nascency in the chemical elements; another is well known to be the presence to those chemical elements of certain conditions as to fluidity and temperature. And what, we would inquire, are the circumstances under which vegetation, in the simplest plants is seen to take place? They are the presence to the chemical elements, namely, to the component constituents of the seed and to the oxygen of the atmosphere, of certain conditions as to fluidity (viz. moisture), and temperature (constituting, if nascency in the elements should also be present, the conditions most favourable for chemical union), together with the essential presence, *in the inanimate or unorganized form*, of matter of the same species as those of which the seed was composed. Here then we have disclosed to us, what it is which constitutes the specific stimulus of the first or simplest link in the organizing chain, namely, the unorganized or mineral matter upon which it is about to confer organization. Here, too, we have suggested to us what it is which must constitute the specific stimulus of each succeeding link of that chain; namely, that for each upon which each was destined to confer organization—that for each upon which each has, from its construction, been adapted to exercise its function of elevating it one progressive step in the great scale of organization. Thus, then, as we have been led to believe in the necessary existence of a chain of progressively advancing organizing agents or atoms, whose function *is to confer* organization; so, too, we believe in an equal necessity, before that function can be fulfilled, for the existence of a corresponding chain of progressively advancing organized structures, whose function is *to receive* organization, and which were designed and adapted for calling into operation the function of the organizing atoms. Between these two chains, at corresponding positions respectively in each, such natural reciprocity we conceive to exist, that when brought (conjointly with the necessary contingency to the atom of increased chemical action), within the sphere of each other's reciprocal operation, an interchange of action, as it were, takes place between them, and each discharges its functions respectively—the atom of imparting, and the reciprocal or stimulus of receiving, the organizing influence. The first link in the chain of atoms is the simplest of vegetations. The first link in the chain of stimulants is mineral matter. The last link in the chain of atoms may be the most highly organized organizing atom existing within the complex organism, man. The last link in the chain of stimulants is some highly elaborated organized product, which may arouse that atom to the discharge of its functional operation—some highly organized structure upon which the last atom can confer an increased organization."— *Freke on Organization*—(1848). pp. 39, 40, and 41.

energy to the materials which it organizes—namely, to " organized residual products," and to offspring " organizing atoms"—will it not I say itself become inorganic ? Hence the dependency of life on disorganization.

Dr. Watters continues—" for life is only produced when it is under the influence of certain external agents [conditions], and, therefore, life-force is the *resultant* of forces as directed by the seed under the influence of these external agents [conditions]."

Dr. Watters unfortunately for me does not mention what these " external agents [conditions] " are. Had he done so I apprehend I could have pointed out among those " external agents [conditions] "—certain materials to be " elevated in scale of organization," and at the same time certain means—(oxygen, heat, moisture, &c.)— for increasing the chemical force in the components of the seed. The former—namely, materials to be elevated in the scale of organization—are what I termed " *the specific stimulus* " of that seed; the latter—viz.: oxygen, heat, moisture, &c.—are the agents which increase chemical action.

Now, I would venture—in all humility—to submit, that the expressions—" specific stimulus" and means of " augmenting chemical force"—are quite as appropriate, expressive, and intelligible as the expression—" certain external agents [conditions] ;" assuming, of course (as I have done), that Dr. Watters' " certain external agents [conditions]" correspond with what I desired to convey by my expressions.

Thus, then, as I have already observed, in *no* mechanical contrivance—be it what it may—in which gravity is the motor force, can motion commence, until gravity has been " unfettered," namely, relieved from the opposition of some antagonistic force which kept the action of gravity in abeyance, and the body to be moved *at rest*. When such antagonistic force is withdrawn, the body to be moved being now " unfettered by opposing forces," becomes "amenable to the laws of gravity," and descends. Consequently in *all* such contrivances clock, lever, or other, there must be a " *logical* antecedent" *preceding* Dr. Watter's " logical antecedent " (viz., gravity or " downward tendency ") " to *all* the various motions "—namely, the withdrawal of some force—be it what it may—opposed to or antagonistic of gravity. Now, what I maintained in 1848, as I have already observed when alluding to this subject before, was this, namely, that the very same principles of arrangement are to be recognized in organic or living creation.

That *vital* motions and resistances have been regulated on principles analogous to those recognized in the physical world. That a *true* analogy may legitimately be instituted and admits of being recognized between the principles upon which the unerring Institutor of of all natural laws has regulated the motions and resistances in His two great divisions of nature, namely, between the motions and resistances of inorganic and of living creature. That is to say, a *true* analogy is to be looked for and recognized between the *causes* of organic motions and resistances and the *causes* of the motions and resistances to be met with in the inorganic world; and consequently—

1st, That antecedently to the molecular motions upon which vital phenomena are dependent there must be a disturbance of the balanced equilibrium between the vital and chemical forces which balanced equilibrium hitherto kept those molecules *at rest.*

2nd, That that balance is most efficiently disturbed by a *simultaneous* withdrawal of the vital force and increase of the chemical force; and

3rd, That the vital force is withdrawn through the agency of a specific stimulus and the chemical force increased by the action of oxygen heat and moisture.

I shall now contrast Dr. Watters' views and my own on the subject of the lever:—

DR. WATTERS.

1. I mean to say, universally, that reaction is equal and opposite to action, and logically *consequent* that while the motions of the two ends of the lever are synchronous, yet if moved by weights, the downward movement is the logical antecedent and the upward the logical consequent.

2. There is no "agency" or "influence" to resist the downward movement of the long end but through the adjustment.

3. Gravity at one end is resisted by gravity at the other; and though

DR. FREKE.

1. I mean to say that the motions of the two arms of a lever have not the most remote resemblance to the relation of "action" and "reaction." Any cause which stops the motion of *either* stops the motion of *both.* How, then, in the name of common sense, can the motion of the one be the "*reaction*" to that of the other?

2. There *is* an agency or influence to resist the downward movement of the long arm, namely, the force which, in opposition to gravity, raised it, which force must be withdrawn before the downward motion can commence.

3. Gravity at one end is *not* resisted by gravity at the other;

the directions of the two ends are opposite, yet gravity is the common motor.

if it were there would be no motion of either arm. It is when and because gravity *is not* resisted that motion takes place.

4. There is no lever agency or influence which radiating from the long end thus leaves it amenable to gravity.

There *is* an agency or influence —namely, the force which raised the long arm—which being withdrawn (and if heat radiating) leaves it amenable to gravity.

Dr. Watters concludes his analogy between life and the actions of a lever with the following derisive remark:—

" The short end of the lever is not the specific stimulus to call into active operation the lever agency or influence."

Upon this remark I have to state that I defy Dr. Watters or anyone else, by any possible distortion of language, to point out the most remote analogy between this statement and anything ever written by me.

And further, even were it otherwise, Dr. Watters will please to bear in mind that the analogy being of his instituting, not mine, I am scarcely to be held responsible for its defects.

The expression—" specific stimulus "—may be in every respect most appropriate when applied to an organic tissue—say the action of light on the retina for instance—while at the same time such expression may be altogether inappropriate if applied to something —it may be remotely analogous—connected with the motions of a lever.

But what Dr. Watters has done is not simply this; but on the contrary he has contrasted my expression " specific stimulus "— as though analogous—with something relating to a lever which has no existence, thereby attempting to cast ridicule on my writings.

I stated in 1848—and I repeat that statement in 1871—that all organic tissues possessed of a specific physiological function—from the simplest vegetation to the cerebral cells of man—require the action of some " specific stimulus " to excite them to the discharge of such function. Thus to illustrate, the action of light on the retina, for instance, is essential to vision.

In 1848 I thus expressed myself on this subject:—

" We called attention, when observing on the general forces which give motion to inanimate matter, to the necessity we conceived there to exist for the operation of what we called that matter's reciprocal or stimulus, before the action of such forces could

be manifested. Our object in so doing was to point to a similar necessity which we regarded as existing, for the operation of an analogous reciprocal or stimulus, before the action of the analogous general force, the organizing influence, can manifest its active operation. We would now direct attention for a moment to what we would call the law of reciprocity, or, more correctly (if we be allowed such expression), the law of specific stimulation, which is equally conspicuous with that of progressive advance. Gravity is, we conceive, not more universally a force operating through matter, than is this law of reciprocity or stimulation—a law universally applicable to operative forces. Let us be understood; what we desire to convey is, that experience presents us with no example of a force operating through matter as a cause of manifest results, that has not been made of necessity, and essentially dependent for that manifestation on the operation of something distinct from the matter through which such manifestation takes place. Such we have seen, in the inanimate world, to be the case with gravity, caloric, and electricity, and such is obviously equally true of inanimate matter's specific laws, or of the forces called chemical.

A little reflection will show that this law extends with a like universality over the entire of the organized world. We see the seed, which for centuries has lain inactive and indolent, spring instantaneously into action when that something is present. We see the function of the contents of the animal ovum for ever undischarged, unless by its stimulus called into action. But, not to multiply examples, how perpetually in our own persons are we told of this law? How completely has our nervous system been made subservient thereto. We find our sentient nerves, whether those of special or of ordinary sense, have each its appropriate agency for calling its function into action. Does the organ of vision discharge its function in the absence of light? Is that of hearing in activity when no vibrations exist? Do not the olfactory and gustatory nerves require something specific in matter's construction, without which smell and taste were for ever unknown? And does not the ordinary sense of touch require contact as its excitant?"—*Freke on Organization* (1848), pp. 35–36.

As I proceeded I pointed out the nature of "the specific stimuli provided for organizing atoms,"—that is to say, the "specific stimuli" provided for calling into functional activity the germs of organic tissues.

The specific stimulus provided for each such atom or germ is—

such materials as each atom or germ is adapted for—" elevating in the scale of organization." See note on page 12.

For each organic tissue—such as the retina brain, &c.—*some* specific stimulus has been provided. I shall illustrate the action of the brain by the explosion of gunpowder on the application of an electric spark. In the explosion of gunpowder, by the application of an electric spark, and the *simultaneous* development of *a flame* may be recognized a not inapt analogy to the development of an idea by a cerebral cell on the action of a sensation coming to it from the sensorium, or of another idea reflected to it from some other cerebral cell.

The following are the analogies to be recognized:—

1st. The electric spark is the specific stimulus which causes a disturbance of the balance of the forces which keep the components of the gunpowder *at rest*. This electric spark is the analogue of a sensation from the sensorium, or of an idea from some other cell.

2nd. The explosion of the gunpowder is the analogue of the molecular motion and decomposition of the cerebral cell.

3rd. The *flame* or flash of light which takes place *simultaneously* with the decomposition of the gunpowder is the analogue of *the idea* developed by the cerebral cell which takes place simultaneously with the decomposition of that cell.

Lest the foregoing should be unintelligible to any I shall endeavour to explain it more clearly. The electric spark which causes a decomposition of the gunpowder, and sets up a molecular motion among its components (hitherto at rest), is, in some respects, not an unapt analogue of a sensation coming from the sensorium, or of an idea reflected from some other cerebral cell, which sensation or idea is the specific stimulus that disturbs the balanced equilibrium between the forces which keep the components of the cerebral cell in their *organic* condition, and *at rest*.

This specific stimulus (viz., a sensation, or an idea from another cell) disturbing the equilibrium between the forces which hitherto kept the components of the cerebral cell at rest—molecular motion and decomposition is now set up among those components, and *simultaneously* with this molecular motion and decomposition the cerebral cell developes an idea. Such idea being somewhat analogous to the flash of light which occurs simultaneously with the explosion of the gunpowder. And it will be observed that neither the *idea* nor the *flash of light* is developed, until the equilibrium between the forces has been disturbed by the application of their respective *specific stimuli*.

When then I state that for the manifestation of a vital pheno-menon—say the development of thought by the brain—namely, the development of ideas by cerebral cells, there is required the action of " specific stimulus"—namely, in the case of the cells of the brain, that of a sensation from the sensorium or of an idea reflected from some other cell; and when I add that the action of such " specific stimulus " is to disturb the equilibrium which before that action—(and consequently before the commencement of the functional activity of the cerebral cells)—balanced the opposing forces of the components of those cells into a condition of *rest*— when I make these statements I may possibly be using highly appropriate expressions. Nay more, in adopting the expression " specific stimulus " in that signification, it is quite possible that I might be employing the most appropriate expression I could select for *that* purpose; and yet, notwithstanding that fact, it by no means follows—as Dr. Watters seems to opine—that it would in the remotest degree be appropriate if applied to a lever; and Dr. Watters will please to remember that I have never applied the expression " specific stimulus " to anything connected with the motion of a lever, such application of that expression being entirely Dr. Watters' own.

But although I do not state that *a specific stimulus* is required to put the arms of a lever in motion, I do state that something analogous in its effects to what in the case of organic tissues *is* a specific stimulus is required for that purpose—namely, some cause which can disturb the balanced equilibrium between gravity and the force which raised the long arm.

In his parody on my expression—" specific stimulus "—Dr. Watters further gives a specimen, at once, of the extent of his parodizing capabilities, and of the character of his logical acumen.

In relation to the terms—"specific stimulus" in the passage he quotes from my publication—Dr. Watters thus observes:—

" ' Behind the peculiar phraseology ' in this, is meant: In a flour mill, wheat is the ' reciprocal ' or specific stimulus to call into ' active operation ' the *flour-producing* ' agency ' or ' influence,' and thus the coal under the boiler, ' unfettered by opposing forces, becomes amenable to inert matter's laws,' and consequently it begins to burn, or is converted into carbonic acid by combining with oxygen.' "

Now, if Dr. Watters be of opinion that such is a legitimate mode of conducting a scientific discussion, I have only to observe that

there is quite as little " identity of thought " between Dr. Watters and me *in that opinion* as there is on the subject of—" the dependence of life on decomposition."

But as Dr. Watters is a logician and fond of tracing the connexion between " *logical antecedents* " and " *logical consequents,*" I shall present him with an example of such connexion in a somewhat curious enthymeme of Dr. Watters' own manufacturing.

In the passage just quoted Dr. Watters' reasoning is as follows— viz. :—

Because wheat is not the specific stimulus of a flour mill to call into active operation the " *flour-producing* agency ; " therefore, an organic structure such as the retina does not require the stimulus of light to call into action its physiological function.

This may, I think, be consigned to the same category with " gravity or downward tendency of the weights is the *logical antecedent* to *all* the various motions of the clock."

So much for Dr. Watters' second analogy.

Dr. Watters' third and last illustration is an analogy he institutes between the phenomena of life and the sinking of lead when placed upon water.

Upon this subject Dr. Watters observes as follows:—

" It is true, as stated in his letter, that Mr. Hinton, in his ' Life in Nature ' of 1862, says :—' The first suggestion of this view appears to have been made by Dr. Freke, of Dublin, 1848.' By ' this view ' in the above quotation is meant, as shown in his letter, ' the doctrine of the dependence of life on decomposition.' But as the word ' dependence ' as used is quite ambiguous, we must try some other expression. When lead is placed upon water, the water gives way and the lead sinks, synchronously, and it may be said, loosely to be sure, that the sinking of the lead is dependent upon the giving way of the water, but the greater specific gravity of the lead is the cause and the logical *antecedent* of the whole movement."

It will be unnecessary to dwell at any great length on the foregoing, inasmuch as it must at once be apparent that the very same errors are to be recognized in it as those already pointed out in Dr. Watters' two other illustrations. That is to say—in this illustration as in the others—Dr. Watters in the first place ignores construction, arrangement of parts, and adjustment as constituting any part of the, so to speak, life of the machine or apparatus with which he contrasts vital phenomena; while in reality these con

structions, arrangement of parts, and adjustments constitute the entire, so to speak, organic life of the several mechanical contrivances introduced: while, at the same time, this organic life—ignored by Dr. Watters in his illustrations—is the only life referred to in the passages quoted from my publication, which passages Dr. Watters contrasts with phenomena to which they bear no analogy.

Dr. Watters states that the lead has been " placed " upon water. If so, something must have placed it there. What was that something? It must have been some force opposed to or antagonistic of gravity. It matters not what the force actually employed for that purpose has been, but it must have been some force which raised the lead and placed it on the water. It may have been heat, or muscular or other force; but be it what it may, the lead must have been raised to the surface of the water by some force opposed to or antagonistic of gravity.

Now, what I have to assure Dr. Watters of is this, namely, that until that force—say the hand which placed the lead on the water—until, I say, that force—be it what it may—has been *withdrawn* from acting on the lead, there can be no descent of the lead, notwithstanding its greater specific gravity.

Till the hand which raised the lead be withdrawn the lead will remain *at rest*, notwithstanding the action of gravity on that lead. The lead is maintained in a state *of rest* by the equilibrium between the opposing or antagonistic forces—gravity and the force which raised it to the surface of the water. Disturb the balance of that equilibrium and *motion* of the lead at once takes place.

How is the balanced equilibrium between these opposing forces disturbed?

In the present instance by the *withdrawal* of the force which raised the lead.

When the hand (or other force) which placed the lead on the water *is withdrawn*, then, and not till then, the lead " unfettered by opposing forces becomes amenable to the laws of gravity," and descends.

Consequently, there is an indispensable necessity for a motion—viz., the withdrawal of the raising force—before gravity is competent to put the lead in motion, and consequently the greater specific gravity of the lead is *not* " the logical *antecedent* to the whole movement."

Our respective views on this subject may be thus contrasted:—

Dr. Watters.	Dr. Freke.
When lead is placed upon water the water gives way and the lead sinks, synchronously, and it may be said, loosely to be sure, that the sinking of the lead is *dependent* upon the giving way of the water, but the greater specific gravity of the lead is the cause and the logical *antecedent* of the whole movement.	The greater specific gravity of the lead is *not* the "logical *antecedent* of the whole movement," inasmuch as the motion caused by gravity must be preceded by the *withdrawal* from the lead of the raising force.

I have now—without the slightest desire upon my part of either misrepresenting or colouring—endeavoured honestly and dispassionately to analyse the three analogies introduced by the author as illustrations of "Dr. Watters' Doctrines of Life."

Of *what* "doctrines of life," I would ask, are those analogies illustrative?

With what object have they been introduced? What doctrine of life are they either designed or competent to illustrate?

Assuming them to be correct, what do they *prove?*

Supposing every statement of Dr. Watters relative to the clock, to the lever, and to the lead upon water were perfectly correct, what do they all *prove?*

Can it be possible that Dr. Watters is of opinion that they afford a shadow of proof of "the dependence of life on decomposition?"

Would Dr. Watters argue that because "gravity or the downward tendency of the weights is the logical antecedent to *all* the various motions of the clock," that therefore life is dependent on decomposition?

What other semblance of a demonstration of "the dependence of life on decomposition" has Dr. Watters given in his "Doctrines of Life?"

Do any of Dr. Watters' mechanical illustrations afford the slightest evidence in support of the physiological law that life is dependent on decomposition? Not in the most remote degree that I can recognize.

Have any of Dr. Watters' illustrations been introduced with the design of proving "the dependence of life on decomposition?" Not that I can recognize. Has Dr. Watters throughout his "Doctrines of Life" advanced one solitary shadow of proof of "the dependence of life on decomposition?" Not that I can recognize.

In the passage last quoted from his " Doctrines of Life," Dr. Watters observes:—" It is true, as stated in his letter, that Mr. Hinton, in his 'Life in Nature,' of 1862, says—'The first suggestion of this view appears to have been by Dr. Freke, of Dublin:" and Dr. Watters goes on to observe that "by this view is meant, as shown in his letter, the doctrine of the dependence of life on decomposition."

Why, then, did not Dr. Watters confine his criticisms to *that* doctrine?

Nothing, however, of the kind; so far from confining himself to the only topic referred to by Mr. Hinton, namely, "the dependence of life on decomposition," Dr. Watters does not make the slightest attempt at a demonstration of that proposition.

In his analogies and illustrations of his " Doctrines of Life," Dr Watters, instead of attempting to demonstrate "the dependence of life on decomposition," simply takes that proposition for granted, and introduces his erroneous analogies to illustrate his own erroneous views as to *how* the decomposition (upon which life is dependent) *is brought about* or *accomplished*. Dr. Watters assuming as a fact what I advocated in 1848, namely, the dependency of life on disorganization, has introduced his illustrations and analogies for the sole and solitary purpose of attempting to establish an untenable doctrine, namely, that a body (say the raised weights of a clock) kept *at rest* by a balanced equilibrium between opposing force can be *put in motion* without a disturbance of that equilibrium. Such is the sole and solitary deduction I am able to collect from Dr. Watters' illustrations and analogies.

They have all been introduced—so far as I can collect—for the sole purpose of proving that in all mechanical contrivances put in motion by gravity, "gravity or 'downward' tendency is the *logical antecedent* to *all* the various motions."

How far that conclusion—even if it were correct—proves " the dependence of life on decomposition," it must rest with the reader to decide.

Before concluding I shall again briefly state what I myself meant by—the dependence of life on decomposition. What I meant to convey by the expression—" the essential dependency of the latter upon the former"—(namely, the dependency of *life* upon *death*)—as quoted from *Medical Times*, 3rd February, 1849, in the passage heading this paper—is simply this, namely—That for the *organization* or formation of *one* organic structure there is

necessity for a simultaneous *disorganization* or decay of *another ;* so that during the manifestation of *organic* constructive or vegetative life *both* these processes—namely, that of the formation of one organic structure and of decay of another—are of necessity *simultaneously* in operation.

It will be observed that these two distinct and opposite processes—namely, that of formation and that of decay—which are inseparably associated and simultaneously in operation during the manifestation of constructive or vegetative life—it will, I say, be observed that these two distinct and opposite processes give rise to two distinct and opposite results—namely, to the *elevation* of matter on the one hand, and to its *depression or degradation* on the other, in the scale of organization.

The organizing constructive or formative process is *elevating* one portion of matter in the scale of organization at the same moment that the process of decay is depressing or degrading another; and—during the combined operation of both—manifestation is given to vegetative life. During the manifestation, then, of vegetative life, *matter is in the act of being elevated in the scale of organization;* and during that manifestation, matter is also in the act of being degraded or depressed in the scale of organization.

Such, then, are the two results of the operation of these *combined processes* of formation and of decay—namely, the *elevation* and the *depression* of matter in the scale of organization.

I would venture to submit that the former of these two results—namely, the *elevation* of matter in the scale of organization—was *the* result of the two for the accomplishment of which nature—if I might so say—had combined these two opposite processes. Nature's design—if I might so express myself—in combining the process of formation and of decay—was *the elevation of matter in the scale of organization ;* and the *depression* of matter in the scale, which simultaneously takes place, is but *contingent* on that design.

The design was the *elevation* of matter—the contingent to that design its *depression.* The end to be obtained was *living ;* the means to accomplish that end was " dying."

The *END* was *formation*, the *MEANS* was *decay.*

Induced by these considerations, I ventured in 1848 to submit, as a definition of " *living*," " the act of being elevated in the scale of organization."

I submitted that as a definition of *living* in contradistinction to dying—namely, the *contingent* process of depression or decay which

is essentially simultaneously in operation; and I ventured to observe—although smiled at, at the time—that it thus became apparent how " death is essentially a part of life."—*On Organization* (1848), p. 45.

In order to obviate the possibility of there being any misunderstanding of my meaning, I shall illustrate the foregoing by quotations from my publication of 1848:—

In relation to the passage quoted from the *Medical Times* (February, 1849), heading this paper, I had been contemplating the manifestation of life by what I termed " the simplest conceivable vegetation," while that vegetation, in conjunction with *inorganic* elements, was giving manifestation to vital phenomena. The two entities consequently under consideration at the time were—the simplest vegetation (viz., an *organic* structure) and *inorganic* elements upon which the simple vegetation was about to confer organization. As to the *effects*—during the manifestation of life—upon the constituents of the former of these two entities (viz., an *organic* structure), I observed, " the final result must be that these constituents will eventually be reduced to the condition of inanimate chemical compounds" (1848, p. 42), while the effects—during the manifestation of life—upon the latter entity (viz., *inorganic* elements), I observed, " must obviously be to convert them into an uniformly organized mass" (1848, p. 43), and I summed up the subject with the following general statement, viz.: " Thus are two essentially distinct and opposite processes of necessity concerned in producing the phenomena of active life; are of necessity in operation for the production of what we imply when we say of a thing, 'it *lives ;*' and thus, too, becomes apparent how death is essentially a part of life."—*Freke on Organization* (1848), p. 45.

Sometime subsequently (in 1851, if I be correct,) Dr. Watters published on the same subject, but entertaining—as would appear from his criticisms—views on that question altogether distinct from those advocated by me in 1848. What the views advocated by Dr. Watters in 1851 are, I am—as I have already observed—but very imperfectly aware, but as it is manifest from his criticisms now under discussion that they are *not* those advocated by me in 1848, I have considered it desirable to explain the views as to the dependence of life on decomposition submitted by me in my publication of 1848, by the foregoing quotations from that publication.[a]

---

[a] The only publication of Dr. Watters in addition to the criticisms now under discussion, I have ever had the advantage of seeing was a paper reprinted from the

Now whatever be Dr. Watters' views as to—" the dependence of life on decomposition"—it is obvious they are *not* the foregoing— namely, those advocated by me in 1848, inasmuch as Dr. Watters declares his inability to see wherein the foregoing essentially differs from the so-called " *wear* and *tear* from vital action," which Dr. Watters states to have been the common property of the profession when he and I first wrote.

Mark then distinctly the views advocated by Dr. Watters in 1851, must be something altogether distinct from those expressed in the foregoing quotations. *What* they are I know not, but I repeat it, they certainly are not those advocated by me in 1848. But what Dr. Watters really means to convey by the expression—" the dependence of life on decomposition "—I find it extremely difficult even to conjecture. Dr. Watters distinctly intimates he does *not* mean by that expression what is conveyed in the foregoing quotations from my publication. What then does he mean?

The *only* meaning I can collect from his criticisms, I can scarcely believe it possible, can be what Dr. Watters intends to convey by that expression. I shall explain. I know of but two kinds of life, namely, *organic* and *animal* life. The expression—" the dependence of life on decomposition "—as used by Dr. Watters, must refer to one of these. To which? Not we have seen to the former— (viz.: organic life)—namely, the life of " the simplest conceivable vegetation," inasmuch as Dr. Watters expresses his inability to recognize any difference between my views on that subject, and the so-called " wear and tear " of life. To *what* life then does Dr. Watters refer when he uses the expression—" the dependence of life on decomposition "?

St. Louis Journal some time—if I mistake not—in 1868. That paper was sent me merely for perusal by a gentleman in England, with a request that I would return it when read. I have consequently now no means of making myself acquainted with Dr. Watters' views, except so far as I can collect them from his criticisms on Mr. Hinton's letter. Conceiving at the time—1868—that in the paper of Dr. Watters' referred to I recognized some coincidence between his views and mine I stated such in a letter to Dr. Watters and requested his acceptance of copies of my publications. Dr. Watters courteously acknowledged the receipt of my volumes. In this country, I regret to say, I have no access to the *St. Louis Journal*, and am not aware whether Dr. Watters has ever published his views in a detached form. Consequently the only source I now possess whereby to acquaint myself with Dr. Watters' views is the criticisms on Mr. Hinton's letter now under discussion, and from them I collect that, whatever be Dr. Watters' views on "the dependence of life on decomposition," they must be some-thing very different indeed from what I advocated in 1848.

Can it be possible that Dr. Watters refers to the phenomena of *animal* life?

Can it be possible that Dr. Watters conceives *himself* to have been the first—and that too in the year 1851—to propound the idea—that the *animal* tissues undergo decomposition while developing the phenomena of *animal* life—a fact well recognized by physiologists before 1848, and first advanced (I believe) by Liebig. Surely *this* can scarcely be what Dr. Watters means to convey by the expression—" the dependence of life on decomposition." If not, to *what* life then does Dr. Watters allude? If the " life" referred to by Dr. Watters as dependent on decomposition be neither *organic* or *animal* life, I can form no conjecture as to *what* life it is; as I know of *no* life but those two. Or is it that Dr. Watters recognizes but *one* kind of life? Is it that Dr. Watters so confounds the two kinds of vital phenomena as to regard all such phenomena as referable to one and the same class?

Is it that Dr. Watters has failed to recognize any distinction between the phenomena of *organic* and those of *animal* life? I believe such to be the fact. Throughout his criticisms—as I have attempted to point out in this paper—Dr. Watters appears to me to refer exclusively to *animal* life and its analogues, and to ignore organic or constructive life as taking any part in vital phenomena. I have endeavoured at considerable length in my analyses of Dr. Watters' illustrations of life, to convince the reader that such is the fact, but it may also be recognized in the subject immediately before us. For I confess I was not aware—till informed by Dr. Watters— that in 1848 the profession recognized the existence of much " wear and tear" in *organic* or constructive vital action—the only species of vital action treated of by me in 1848. I was not aware that in 1848 the profession recognized much " wear and tear" in the growing of a tree for instance. I was under the impression that the functional activity of the *animal* tissues being destructive of their organization—a fact well recognized before 1848—was what was understood by the " wear" and " tear" of life. In this statement of Dr. Watters there is I think to be recognized the grave error which to me appears to pervade the entire of that gentleman's criticisms, namely, his neglecting to discriminate between two classes of vital phenomena, in their nature quite distinct. Dr. Watters—as I have endeavoured to prove—does not appear to discriminate between the phenomena of *organic* and those of *animal* life. Dr. Watters appears to me, throughout his criticisms, to confine his ideas of vital action

exclusively to phenomena having relation to manifestation of *animal* life, ignoring the phenomena of *organic* or constructive life as constituting any part of vital action. This I have endeavoured to point out at some length when analysing Dr. Watters' illustrations.

Now it is of the utmost importance to the present discussion that it should be clearly borne in mind, that my observations in the various quotations from my publication relate exclusively to organic or constructive life, and have no reference whatever to the phenomena of animal life. It was the life manifested by "the simplest conceivable vegetation" that I was contemplating, and my observations applied exclusively and alone to such life, namely, the life that is common alike to all living beings universally. I did not write on the subject of *animal* life till some years subsequently. The foregoing observations had no reference whatever—and were entirely inapplicable—to the phenomena of animal life.

And yet, notwithstanding such is the fact, Dr. Watters parodies my writings by applying to the phenomena of animal life, expressions of mine that had no reference whatever to that subject, but related exclusively to a totally distinct and in some respects opposite class of phenomena.

There is one additional topic in "Dr. Watters' Doctrines of Life" which I leave undiscussed in this paper, and that for reasons I shall explain. I allude to the question as to the relation in which "increased decay and increased vital action" stand towards each other in the inflammatory process. I decline entering into that question on the present occasion for a twofold reason, namely, 1st. Because the magnitude of the subject is such that I could not possibly do justice to my own views on so comprehensive a question without swelling this paper to a dimensions which would frustrate my object in writing it; and 2ndly. Because being wholly in the dark as to the details of Dr. Watters' views on that question, it would be impossible for me to engage in a discussion upon a subject upon which I am entirely ignorant.

I can, however, assure Dr. Watters that the question referred to is one I have not overlooked; and I may add that, having been now compelled, after so long a silence, to resume my pen, it is possible that ere long I may afford Dr. Watters an opportunity of criticising my views on that subject. I have long had by me in manuscript ample material to form a somewhat goodly volume on that very subject. But being an Irishman who had hitherto met

with scant encouragement as an author, I have felt but little inclination to publish.[a]

However, on perusing " Dr. Watters' Doctrines of Life,". I felt I had no longer any option on that subject, and that whatever my own inclination might be, I had now no choice between publicity and silence. It had now become imperative on me, as a duty to Mr. Hinton, to make some observations on " Dr. Watters' Doctrines of Life." Having now done so, it is possible I may not as yet resign my pen.

ART. II.—*Removal of a Foreign Body from the Larynx by Laryngo-Tracheotomy.* By EDWARD H. BENNETT, M.D., F.R.C.S.I.; University Anatomist; Surgeon to Sir. P. Dun's Hospital.

ON September 1st, 1870, a boy eight years of age, was brought by his mother to the Dispensary of Sir P. Dun's Hospital, suffering from difficulty of breathing. The mother stated that on the evening previous the boy had come home in great distress and told her that he had swallowed a plum stone, which was choking him. She said that after he became quiet his breathing assumed exactly the same character as it then had. During the night the boy slept soundly, but his difficulty of breathing was in no way relieved by sleep. At first sight the boy seemed to have but little wrong with him. He was a handsome child, with large dark eyes and a clear skin. While I was examining him the difficulty of breathing ceased, and he showed no sign of venous congestion. On noticing this to the mother she at once said that a similar change had come over him when his father came home the previous night and was told of his distress. A few moments terminated this interval of relief, and the breathing became

[a] I should not, however, neglect to avail myself of the present opportunity to express my deep sense of gratitude to the Medical Times, London, 30th December, 1848, and to the London Medical Gazette, 22nd March, 1850, for the flattering and complimentary terms in which those two ably conducted journals generously reviewed my publication of 1848. At that time the Medical Times and the London Medical Gazette were two distinct periodicals under different management, but have since been amalgamated, and now constitute a single journal. Both these periodicals, at the time referred to, favoured my publication of 1848 with highly complimentary reviews, for which, notwithstanding the distance of time, I would now desire to tender my warmest and most grateful acknowledgments.

laboured, all the muscles of the trunk and face acting strongly at each inspiration; the face and lips were, however, free from congestion. It seemed clear that the temporary relief was due to the diversion of the boy's attention, caused by fear. On stripping his chest all doubt as to the existence of some obstruction to respiration was removed; the whole of the muscles of the thorax were seen acting with great force, the lower ribs being forcibly retracted by the diaphragm at each inspiration. The boy could speak in a whisper, but it was difficult to induce him to make the effort, as he evidently suffered in the attempt. His voice, though a whisper, was free of all stridor. On examining the chest with the stethoscope no deficiency of respiratory murmur could be noticed in either lung, nor any stridor or other morbid sound. His mother could not be induced to leave the boy in hospital until she had the opportunity of seeing her husband on his return from the day's work. She promised to bring him back early in the evening, but did not do so until night time. At this time no change having occurred either in the symptoms or physical signs I resolved to wait until the morning before making any attempt to remove the obstruction, in order that I might have the advice and assistance of my colleagues and the benefit of daylight in dealing with the case. I made an attempt to examine the larynx and trachea with the laryngoscope, but found it impossible to manage the patient, and desisted for fear of altering the condition of affairs for the worse by any struggle. I concluded, from the absence of laryngeal or pulmonary symptoms, that the foreign body was impacted in the trachea, but felt that uncertainty in my diagnosis which necessarily results from negative signs being the only guide. On the following morning Drs. Adams, Butcher, and Little met me in consultation, and confirmed my diagnosis; they agreed with me that tracheotomy should be performed without further delay. The physical signs and the boy's general condition were not materially altered—the character of breathing not at all. Some sibilant rales existed in the region of the root of the lungs, but no marked stridor, nor any appreciable deficiency in the amount of air entering either lung. The boy had slept the greater part of the night, but woke repeatedly, and he seemed slightly weakened by the continued labour of breathing.

Chloroform was administered without any unfavourable change occurring, and without any diminution in the respiratory efforts.

I opened the trachea without any difficulty or hemorrhage

occurring, thanks to the able assistance of my colleagues Drs. Butcher and Little, and the favourable influence of the chloroform. The thyroid veins were distended, but they were easily held aside, and the trachea was reached without any of them being opened. No artery required ligature. I opened the trachea freely by a vertical incision, and we held the sides of it open with a pair of blunt hooks. The air passed to and fro without any relief to the respiration, and it became at once evident that the obstruction was seated below the opening. I waited a moment or two to see what would happen, but no change occurred. I then passed a long probe down the trachea, which caused coughing, but no relief, and no foreign body could be felt. I then asked Dr. Butcher to try the probe, but he also failed to strike any obstruction. These attempts each caused cough, and with each the distress of breathing increased, although the action of the chloroform was fully maintained. I myself made a further attempt with the probe to examine the bronchi, if possible; suddenly, during a violent fit of coughing, a sudden change occurred while I had the probe carried to the furthest extent. Without my feeling or seeing any foreign body, a complete arrest of respiratory effort and cough took place, so completely that I for the moment thought the boy had ceased to breathe, and I exclaimed that he was dead. My colleagues at once set me right, and I saw that the breathing was now perfectly quiet and free from all obstruction The boy slept a few minutes, and woke up from the chloroform free of trouble. I introduced a full-sized tube into the incision, not daring to close the wound, as the foreign body was still unaccounted for. No positive evidence as to the condition of the voice could be obtained, and we hoped that the body had been driven into the pharynx and had been swallowed.

But little distress followed the operation; slight fever for a couple of days, but nothing to cause alarm; a great amount of viscid mucus collected in the tube for some days, and required constant care and frequent removal of the inner tube. After a week this ceased, and the boy could speak in a whisper and draw air through the larynx. I therefore thought it wise to remove the tube and see how matters would go on when left to themselves. The foreign body had not appeared in the discharges from the bowel, which had been carefully examined daily, and stimulated by purgative medicine. I was therefore still in doubt as to its absence from the air passages. I removed the tube entirely on the morning of the 8th September, and left the boy breathing through the wound,

which remained open, and occasionally speaking in a low voice, and apparently getting some air through the larynx. I visited him in the afternoon and found him hot and flushed, and breathing through the wound with some difficulty, as it was partly obstructed by dry mucus and by the contraction consequent on removal of the tube. Not being satisfied with his condition, I re-introduced the tube, and found that instant relief followed, and that he was inclined to sleep. I therefore left him breathing through the tube. In the morning he was as well as possible, and could speak a word or two clearly when the finger was placed on the tube. I again removed the tube, thinking that a second trial might fairly be made to dispense with it, as no evidence existed of a foreign body being lodged in the larynx—none, at least, that we could discover. In the evening before I called to see the boy, the resident surgeon, seeing the same distress set in as had occurred the previous evening—headache, flushing, and difficulty of breathing—attempted to introduce the tube and failed. The wound was more contracted than on the previous evening, and the boy was more difficult to manage. On my arrival I found that the condition of the parts was much altered, partly, of course, by the unsuccessful attempt to introduce the tube, but chiefly in consequence of their contraction. I therefore waited for a short time until I obtained the assistance of Dr. Little, fearing that I might have to enlarge the wound. Daylight had gone before we could meet, and our difficulty was proportionately increased. I placed the boy's head on my knees as I knelt on the bed, and fixing the trachea with Chassaignac's instrument, which I had used in introducing the tube on previous occasion, I passed the tube into the trachea, but to my great alarm no air passed through it; the boy got livid, was convulsed, and ceased to breath. I at once removed the tube and passed a bent probe, with which the side of the wound had been held back, down the trachea, air passed in, and as I drew the probe upwards respiration was re-established. I at once passed the tube below the curve of the probe, and all was right. The boy rallied, seeming none the worse for his temporary asphyxia, and settled to sleep. It was now clear that the foreign body was lodged above the tube, between it and the larynx. I therefore determined to lose no time in attempting its extraction, which I thought could not be very difficult, considering the exact knowledge I had of its position. On the following morning the boy's voice was found to be notably altered; it was difficult to get him to make an effort to speak, and

when he did the abnormal character of the sound, which was a kind
of screech, showed that the body was in the rima glotidis or very
close to it.   We placed him under chloroform, and I dilated
the wound, upwards, sufficiently to enable me to introduce a forceps
into the trachea.   I could touch but not grasp the body, although
I was armed with a large assortment of forceps curved in various
ways; a probe touched the body readily enough, but could not
move it.   My colleague Dr. Butcher failed, as I had done, either
to grasp or move the body.   We then attempted to push it
upwards into the larynx, but this attempt failed also.   As pro-
longed efforts seemed only likely to do harm, I re-introduced the
tracheal tube and put the boy to bed, determining to attempt the
extraction of the body from above on another day.   Next day, the
boy being sufficiently recovered, I attempted the extraction from
above.   Having fixed a piece of timber between the molar teeth
on the left side of the boy's mouth, I passed a laryngeal forceps
into the larynx and readily touched the body, but found it impos-
sible to open the blades so as to catch it, or to move it.   I tried all
the varieties of forceps, those opening laterally, antero-posteriorly,
and those with the pivot close to the point, but all equally failed to
grasp the body.   I should have attributed my failure to want of
skill on my part, although I found it easy to touch the body,
had not the same failure occurred with the instruments in the
hands of my dexterous colleague Dr. Butcher.   All these attempts
to extract the body by milder means having failed, I resolved
to divide the larynx in the middle line to an extent sufficient
for its extraction.   In this opinion my colleagues concurred.
I therefore allowed the boy a few days to rest, breathing through
the tube; and on the 20th September I proceeded to operate.
Chloroform having been administered through the tube, I divided
the soft tissues on the middle line above the tube, and having
the larynx well steadied, I passed a knife through the thyroid
cartilage, exactly in its centre, some distance above its lower
border.   As the knife entered the larynx I felt it strike a hard
substance which I knew could be nothing but a foreign body
in a structure so soft as a child's larynx.   I at once cut down
towards the tube through the middle line of the cricoid and upper
rings of the trachea, in order to get room for the introduction of
the forceps; although I tried not to displace the body from the
position in which the knife struck it, I did so in introducing the
forceps, but readily found it again, and to my great relief extracted

it. It proved to be the half of a plum stone, slightly jagged in being cracked by the teeth, measuring $\frac{9}{16}$th of an inch in length by $\frac{5}{16}$th in width. No distress followed the operation, and in a few days the boy could speak naturally on the tube being closed. I therefore took it away and allowed the wound to heal. The boy left the hospital shortly after, and I have several times seen him during the past year, well, and without having sustained any damage to his voice.

The diagnosis of the position of the foreign body in this case was far from easy. In the early stages it was clear that some obstruction existed in the air passages, but it was difficult to account for the fact that no physical sign could be detected which could fix with certainty its position, while the respiratory efforts were so great, and were maintained without change for so long a time. I tried to determine the position of the body by the laryngoscope, although I had little hope of success with a patient so young, because I had, on a previous occasion, effected an accurate diagnosis in a case in some respects similar. The case differed, so far as this point is concerned, simply in the duration of the symptoms and in the ages of the patients. A young woman, under treatment in the hospital for some disease quite distinct from laryngeal, was sitting working on the side of a bed, talking and laughing with a fellow patient. She was sewing in buttons, and was thought to have had one in her mouth. She suddenly coughed, and fell back struggling for breath. The resident pupil was sent for and concluded, from the condition of the patient and the statement of her companion, that a button had become lodged in the air passages. He at once sent for me, and in about a quarter of an hour I arrived. He met me in the passage to the ward, knife in hand, and told me that he had resolved not to wait more than five minutes longer, as he feared the girl would die if not relieved. His experience at that time had been far beyond that of most pupils, and he wanted neither the skill or courage to perform tracheotomy. I therefore concluded that the case was one which would, in all probability, require operation. The patient sat in bed struggling for breath, with a face deeply congested and unable to speak. She was evidently, too, in great terror. On examination of the chest I was surprised to hear the respiratory murmur clearly in both lungs when she breathed, and in no place could I hear any abnormal sound. The sun shone into the ward at the time, and I at once placed her in a chair wrapped
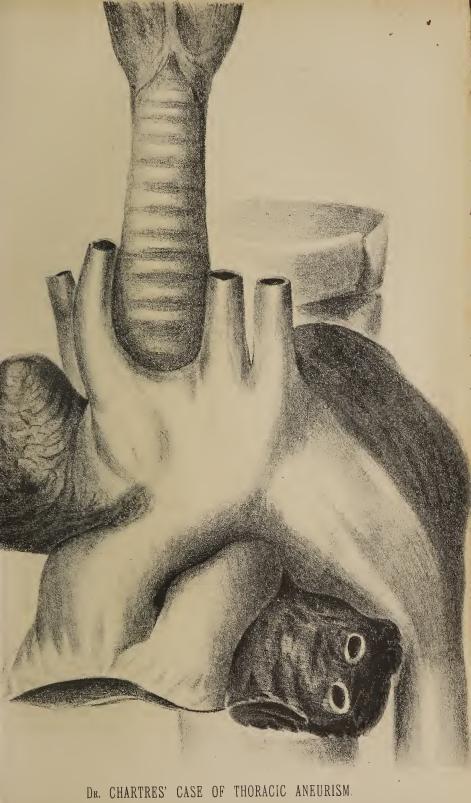
in her blanket, and examined the air passages with the laryngo-scope. Her terror made the proceeding all the easier, for she did everything she was told at once, believing fully that her life depended on her obedience. To my surprise, almost at once I was able to see not only the interior of the larynx but of the trachea, to the bifurcation; I was able to see that the obstruction to respiration was due entirely to laryngeal spasm, and that no foreign body was present in the air passages above the bronchi. I could only get hasty glances into the parts below the vocal chords between the periods of laryngeal spasm, but these were rendered complete by the wide dilatation of the rima during the times of relaxation. In a few minutes the truth of this diagnosis was verified, for all difficulty of breathing ceased on the action of a powerful emetic—two grains of tartarized antimony, twice admi-nistered in the space of ten minutes. In this case the cause of the spasm was clearly hysteria, for the menstrual flow set in immediately after the action of the emetic subsided. I have known a similar case in which the spasm yielded to the division of the parts superficial to the trachea, attended with free venous hemorrhage. In this case, had a diagnosis been correctly made, so violent a remedy might have been spared.

I think that the peculiar shape of the foreign body in the case I have recorded accounts for the absence of any deficiency of the respiratory murmur in the lungs, or either of them; and also for the fact that the probe failed to touch it when introduced through the wound on the occasion of the first operation. The doubt as to the position of the body on that occasion, after its passage to the upper part of the trachea, above the incision, might have been cleared by examination with the probe, but few surgeons would, however, wish to prolong such an operation after the obtaining of complete relief. Again, I believe that had I been prepared with proper forceps, and free from the embarrassment of dealing with the case, with the life absolutely in my hands, that I might have caught the body on the occasion of re-introducing the tube for the second time, when I first became positively certain of its position. In the subsequent attempt to extract the body without dividing the laryngeal cartilages, my failure was entirely due to the impaction of the body in the rima and the impossibility of opening the blades of a forceps in this position, so as to permit of its being grasped. The dimensions of the body are quite sufficient to account for this when considered in relation to the size of the

rima and other parts of the larynx in the child of eight years old.
The operation of Desault and Boyer, of division of the thyroid
and cricoid cartilages, has been so often performed in late years
that it is unnecessary for me to make any remark with reference
to it, except, perhaps, to notice the very short time that was
required for the restoration of the voice in its integrity in this
case. In less than a fortnight the boy spoke well and without
any change in the character of his voice. This rapid recovery is
chiefly due to the fact that the division of the thyroid cartilage
was not made through its entire length, but only through the
lower part, and so as to separate the attachments of the vocal
chords. Before concluding the account of this case, I would wish
to draw attention to an instrument which I found of the greatest
use in the introduction of the tracheal tube on each of the many
times that I had to use it—namely, Chassaignac's blunt hook.
This is formed of a forceps like a common dressing forceps, to
which, at the end of the blades, a short pair of blades are
attached at a right angle, and hinged to each other at their ends.
This arrangement acts so that when the forceps is closed the
whole instrument forms a blunt hook; when it is open the
instrument, still being a blunt hook, the angle of junction of the
blades opens sufficiently to enable the tracheal tube to pass
between them. The instrument is used by inserting it with the
concavity of the hook directed upwards in the upper extremity of
the incision in the trachea; it so serves to fix the trachea safely,
and the opening of the blades gives room to insert the tube
without trouble into the trachea below it; the tube being intro-
duced and adjusted, the hook can be removed at leisure.

ART. III.—*Case of Aneurism of Thoracic Aorta.* (*Two Aneurisms
and an expansive Dilatation.*) *Death from Rupture of a Sac.* By
J. SMITH CHARTRES, M.A., M.D., Dublin University; Surgeon
8th Hussars.

JOHN JONES, private, 8th Hussars, delicate anæmic appearance,
lymphatic temperament, fifteen years' service in cavalry, ten and a
quarter of which were spent in India, where he suffered from five
attacks of syphilis, two of which were treated with mercury, three
non-mercurially, and from four attacks of tropical fever; a man of

DR. CHARTRES' CASE OF THORACIC ANEURISM.

ordinary temperate habits and without any marked gouty or
rheumatic diathesis, was the subject of the disease in question.

He was in hospital under treatment for a contused wound of
the left shin produced by the kick of a horse in August, 1870,
when the injury proved very indolent, and his general health ap-
peared much deteriorated, as he had become anæmic, emaciated,
debilitated and " hipped;" complaining of numerous pleural stitches
supposed to be from old adhesions in left side; he looked prema-
turely aged, broken down, was reckoned a grumbler, making the
most of everything, and was discharged much improved on the
3rd October following.

On the 19th March, 1871, he was again admitted for general
debility, complaining of severe burning pain in his back between
the shoulder blades, constant, influenced by changes of weather, and
relieved by anodyne liniment, sinapisms, and hot stupes, &c.
After a short sojourn he was again discharged to barracks, where
he was employed on light work in the cook-house, exempt from
military duty, and being thus enabled to keep out of hospital and
medical surveillance, from 28th March until 6th June, 1871, the
date of his present admission into hospital for aneurism of
thoracic aorta.

On this morning he was in great distress, with a countenance
expressive of much anxiety, and suffering from apparently urgent
symptoms of laryngitis, with paroxysms of impending suffocation
produced by exertion; an accurate examination of the larynx and
trachea, however, having failed to discover conditions to account for
these symptoms, the epiglottis being thin and flaccid, the rima
patent and free from obstruction, œdema, or other thickening, the
trachea without tenderness on pressure, and there being an entire
absence of fever, the existence of an aortic aneurism or other intra-
thoracic tumour was at once inferred, from the mimicry of the
laryngitis, combined with the fact of his previous general bad state
of health, and former complaint of thoracic and dorsal pains.

The symptoms which presented themselves were separated into
auscultatory and rational signs. Of the former were noted, dulness
on percussion to right of first bone of sternum, and beneath sternal
half of right clavicle extending as low down as cartilage of third
rib, where a marked impulse was heard with stethoscope, both
cardiac sounds being loud and distinct, especially the systole, which
became gradually fainter as the instrument was moved towards apex
of heart; there was no dulness elsewhere in front or behind, no

bruit or whiz audible anywhere; the heart's action was distinctly audible over front of chest, and posteriorly on both sides of the spine; but it was thought by Dr. Innes, C.B., who saw the case with me shortly after admission, that here on the left side of the second or third dorsal vertebra, the second cardiac sound was somewhat prolonged and stridulous or harsh.

There was deficiency of respiratory murmur throughout both lungs, which were clear and resonant on percussion, the vesicular breathing being materially masked by the existence of loud laryngeal stridor, loud wheezing sounds, with sonorous snoring like breathing and of varying modulations, were plainly heard at and around summit of sternum.

Of the latter or rational signs, were throbbing or pulsation visible on a careful lateral view over seat of dulness to right of first bone of sternum, felt by the hand, sensibly communicated to the stethoscope, and rendered much more evident and distinct by the impulse given to the hand at the termination of a forced expiration; there was, however, no bulging, prominence, or tumour, no alteration of superficies, outline, or shape of thorax discoverable; those depending upon pressure effect were as follows:—viz., from pressure on TRACHEA, ordinary cough, husky, tickling, with mucus expectoration, *continuous* dyspnœa, wheezing, sonorous breathing, want of sufficient expansibility of chest. On LUNGS, dyspnœa and cough, but without any hæmoptysis. On NERVES, thoracic pains of an *intermittent* sharp neuralgic character; dorsal pain referred to about fourth dorsal vertebra of a *continuous* and burning kind; cough expiratory, *paroxysmal*, with an occasional slight metallic ring, dyspnœa *paroxysmal*, aggravated by exertion so as to almost threaten suffocation, and modified by position, viz.—lying on left side caused most distress; lying on right side, or even back, afforded comparative ease; sitting erect increased, leaning or bending forward lessened the distress; thus exertion and alteration of position alone seemed to influence this symptom; stridor harsh and loud, most marked during inspiration, and resembling a husky person snoring, varied at times with stridulous wheezing; aphonia, husky—hoarse— and whispering rancous, substituted for the natural voice; there was no want of harmony between pupils, whether as regards size or mode of action; ON ŒSOPHAGUS, THORACIC DUCT, LYMPHATICS, DYSPHAGIA referred to episternal notch and centre of first bone of sternum, intermittent in degree but constant in presence, emaciation, anæmia, &c.

On VEINS, turgescence of veins of left side of the neck and of thorax, where external jugular with tributaries, of the former, and external superficial, of the latter, were found enlarged and distended in marked contrast to those of opposite or right side; no œdema or dropsy. On ARTERIES, carotid of right side was found to beat more strongly than that of left, the temporal of left side was silent, that of right, active; there was no appreciable difference between radial or femoral arteries. On BONE, burning constant dorsal pains, affected by changes of weather, said to be much less felt on mild dry days.

From the above phenomena, the diagnosis arrived at was that of aneurism of thoracic aorta, at its posterior descending portion most likely, with probably a fusiform enlargement of the first or ascending portion as well, he was put on antispasmodics and sedatives, consisting of Valerian, spirits of chloroform, and tincture of hyosciamus draughts, the inhalation of a few drops of chloroform on a piece of lint, hot stupes, sinapisms, and extract of belladonna to the throat, and the inhalation of the steam of hot vinegar and water occasionally, &c.; passed a fair night, was better next morning the 7th, when he was ordered forty-eight grains of the iodide of potassium, four drachms of the tincture of assafœtida, four drachms of tincture of hyosciamus, in an eight ounce mixture; one ounce of which was to be taken four times in the day, the antispasmodic draughts and chloroform to be kept in reserve, and used as occasion might require; passed a tolerably good night, and seemed easier on the morning of the 8th instant; the iodide of potassium mixture was omitted, the draughts ordered to be resumed, with the inhalation of chloroform, and a draught of 25 drops of chlorodyne at bed-time; he passed an easy night, until half-past eleven o'clock, when on turning over from his side to his back, he felt suddenly a severe pain in stomach and abdomen, especially over the left side, and extending upwards over the ribs; felt sick, but could not vomit; was pale, exsanguine-looking, collapsed, hands cold and livid, feet warm, pulse hardly to be felt, belly tense and hard; after a sedative draught, sinapism, hot stupe, and a little brandy and water, he rallied and expressed himself more comfortable and easy, but complained of a sense of weight about the stomach, and stated *that he has felt no pain in the back since the pains in abdomen began;* his easiest position being now on the *left* side, the exact reverse of what it used to be before.

His respiration being tolerably free, and there being at this time

no urgent laryngeal distress, from the suddenness of the seizure, his collapsed condition, blanched appearance, and almost complete pulseless state, it was inferred that the aneurism had given way in some direction or other, but in which was not very clear; at this time the pains of chest and abdomen became so severe that he was obliged to keep perfectly still, the slightest motion aggravating them considerably; but when at rest he seemed comparatively easy; had rallied during the early part of the morning and afternoon of the 9th instant, but about 3 o'clock, p.m., when taking a drink he fell suddenly back upon his bed and expired.

Examination of body 20 hours after death.—Body emaciated and exsanguine looking; head not examined; thorax, lungs healthy except for a considerable extent around the root of each, where a large amount of dark coagulated blood was found to be extravasated and infiltrated throughout its substance; pericardium healthy, bathed with a normal amount of fluid secretion; heart was large, soft, flabby and pale, but its chambers and orifices apparently quite healthy; aorta, at its origin was of natural size, but in its first or ascending stage, and just where it emerged from its pericardium, was found a small globular aneurismal pouch, about the size of a small "lime fruit," projecting upwards and to the right of the arteria inominata, to the outer surface of which it was attached or applied, for about a quarter of an inch from its origin.

The anterior surface of the middle or transverse portion of the arch was found somewhat dilated in front, or rather prominent forwards, slightly bulging and extending upwards to, but not actually implicating the origins of the great vessels, as they here spring from the artery.

The third posterior or descending portion of the arch, from just beyond the origin of the left subclavian throughout its whole extent, and implicating the contiguous portion of descending thoracic aorta beyond, as low down as the body of the 5th dorsal vertebra, was found to be the seat of a false sacculated aneurismal tumour filled with laminated fibrine, the size of an orange, closely adherent to the vertebra behind, the bodies of which forming the posterior boundary of the sac were extensively eroded and worn away.

The tumour had kept an almost *central* position, not bulging on one side or other of the spine, but projecting more forwards into the anterior mediastinum, the pneumogastric and recurrent nerve had been stretched and somewhat flattened, the walls of the aneurism very thin in places was found to have given way by a large round

sloughy looking opening which could accommodate the tip of the forefinger, on the right side behind the root of the lung close to the œsophagus, whence blood in a copious stream had issued, not only into the adjacent pulmonary structure on both sides, but conducted down by and along the tube of the aorta itself, had reached the aortic opening in the diaphragm, and through it diffused itself widely all over the abdominal cavity, where it was found occupying all available situations or vacancies, the left hypochondrium, lesser omentum, foramen of Winslow, &c., more especially, and lying in front of and among the coils of the intestines, where its polished smooth dark black currant jelly-like appearance, formed a marked contrast to the white glistening surface of the exsanguine bowels.

The aorta was the seat of extensive atheromatous patches and osseous degeneration; one large patch of which latter, with spiculæ of bone projecting, appears just above the attachment of one of the aortic valves at the origin of the vessel from the left ventricle of the heart.

On opening the abdomen, in addition to the appearances described above, a large quantity of serous and sero-sanguineous fluid appeared and escaped, there was no evidence of any peritoneal inflammation; the liver was enlarged and tough; its capsule thickened and easily separable; the spleen was of a pale bluish colour externally, small, shrunken, and tough, with a dense fibrous feel; when incised it appeared internally of a pale dirty chocolate colour, and was of a dense and resisting structure; kidneys and other organs in abdomen appeared healthy.

REMARKS ON THE ABOVE CASE.

The atheromatous and degenerated condition of the aorta was doubtless the result of tropical service, the combined effects of syphilis and mercury, as well as repeated attacks of tropical fever; and it is interesting to note the state of the *spleen* in this case also as tending further to establish some connexion between its shrivelled tough condition, and the degeneration of the arterial coats, in a manner similar to that of the case previously reported by me, amongst the proceedings of the Dublin Pathological Society, in the *Quarterly Journal* for February, 1871,[a] to which I refer the reader.

---

[a] In the paragraph here alluded to, are two misprints, which it is necessary to allude to, for the proper understanding of its meaning; the word *respiratory* should be read for *restorative*, and the name *Kirke* should be read for *Keiller*, as the author of the Physiology quoted.—J. S. C.

The existence of the globular aneurism in the first stage of the vessel, which alone gave rise to auscultatory phenomena, tended to confuse rather than elucidate the diagnosis of the sacculated false aneurism of the third stage and adjacent portion of descending aorta; whilst the absence of whiz or bruit, second centre of impulse or pulsation corresponding with the inferred seat of the *latter* tumour, and general meagre amount of auscultatory signs, were as remarkable in this case as in many others of a kindred nature.

The mimicry of laryngitis was almost perfect, and the expediency of laryngotomy suggested by the prominence of the symptoms during periods of urgency; the cessation of the pain in the back, after the pains in the abdomen began, was due to the relief of tension, the aneurism of third stage and descending thoracic aorta experienced from loss of blood, effused from rupture of its sac; and the change of *easiest position* from decubitus on *right* to that on *left* side, was probably referable to the same cause.

Throughout, the effects of pressure produced the most decided and remarkable symptoms, but no want of harmonious correspondence in any way, between the pupils of the eyes could be discovered, although daily looked for. I do not remember a case previously recorded anywhere, of blood from a thoracic aneurism having found its way into, and thoroughly permeated in every direction of the cavity the abdomen.

Art. IV.—*Cardiac Lesions Consequent on Syphilitic Cachexia.* By Mr. Morgan, F.R.C.S.I., M.D., University of Dublin; Surgeon to Mercer's and to the Westmoreland Lock Hospital, Dublin ; Professor of Surgical and Descriptive Anatomy, R.C.S.I., &c.

SYPHILITIC AFFECTIONS OF THE HEART.

Amongst the many protean effects of this extraordinary disease I have not seen the heart suffer any direct change till the period of the gummy or tertiary products has been reached, which though usually not developed for years after the admission of the primary virus, yet occasionally shows itself at an early period. I have frequently seen well-marked gummata form in adults within a year after the first infection, or even within a shorter period, and in children within a few months after birth. It indeed appears that

once the confirmed cachexia resulting from a syphilitic taint has established itself for any length of time, the heart frequently suffers from the general malnutrition co-existing, and patients seem gradually to " die out," without any prominent or distressing symptom, or without any marked external evidence of the syphilitic taint. There may be on the body a chronic gummatous tumour or an ulceration, or perhaps a nodose tumour, but there is no very distressing complication. The general history is usually thus given.

1. A primary infection, perhaps ten or fifteen years antecedently.

2. Evidences of a constitutional infection, rash, alopecia, or mucous patches.

3. Pains and some gummatous tumours or ulcers, but complicated now with increasing weakness and langour. The skin is usually rather below the normal heat, and the temperature is persistently some two or three degrees under the healthy standard; the appetite is small, and the complexion of an unhealthy hue; the pulse is feeble, and not increased in frequency, and all the organs perform their functions inactively.

On stethoscopic examination there is a feebly-marked systolic sound, occasionally a slight anæmic bruit, and diminished impulse. After a time the feebleness of the circulation increases, the pulse becomes weaker, and chilliness is much complained of—and in one instance, so great was the langour of the circulation that there was the greatest danger of gangrene of the face occurring—indeed the feebleness of the circulation and the wonderful influence of stimulants was most remarkable. I had the opportunity of seeing the following interesting example.

The patient had been diseased by syphilis several years previously, and for ten or twelve years had suffered from varying evidences of the syphilitic taint. The chief symptom on admission being severe pains, the heart's action became feeble, and great debility ensued, so that when admitted to hospital she had to be carried to bed. In a few days the nose became discoloured and distinctly cold to the touch; the tip was in a state where gangrene was imminent, while the entire surface extending to the cheeks was of a gangrenous hue. Stimulants were now freely given, warmth applied to the surface, and every means used to sustain the circulatory powers; the nose and face were enveloped in wool. After some days of very great danger from gangrene the parts gradually became relieved, the lividity disappeared in about a fortnight, but even during several weeks subsequently the tendency to

gangrene was most persistent, and the discoloration was a constant index of the condition of the circulation. If stimulants were withheld, immediately the discoloration increased; and corresponding with their administration and the revivification of the heart's action, it directly disappeared. What is interesting in this case is the fact that after several weeks of incertitude and anxiety as to the final result, the patient's strength was by degrees restored, and she finally was able to leave hospital for (it is supposed) one of the Unions. During last month I examined this patient. The heart's action was feeble, she suffered from pains only, and was intensely cachectic. There had been no return of the discoloration.

A second case under my own care was not so fortunate, but in this instance the patient suffered in addition from ulceration of the pharynx. The gangrene, however, was more decided, exhaling the peculiar and sickly odour so characteristic, and the patient sank with comparative rapidity. The patient was aged 32; had been ten years in the way of being diseased, and was suffering when admitted to hospital from great debility and ulceration of the throat. She was admitted November 17, 1868, and on December 24, 1868 (five weeks from admission), a dark spot first appeared on the nose. During the intervening period she had been treated by tonics, chlorate of potash, and stimulants freely administered. The heart's action was from the first exceedingly feeble; there was no abnormal sound; there were then no evidences on the surface of syphilitic influence, but she was wretchedly thin and broken. The pulse was extremely weak, and varied from 70 to 80. The gangrenous evidence steadily increased from December 24, 1868, to January 4, 1869, till the appearance shown in the drawing (taken three hours before death) was presented. The extremity of the nose was completely gangrenous as far as the nasal bones, and the gangrenous hue extended over the cheeks and occupied the upper lip extending to the gum. On *post-mortem* examination the lungs and viscera were found healthy, but the right kidney had a small tumour about the size of a small bean in its lower part, apparently of a gummatous nature, and the fundus of the uterus also contained a small, well-defined tumour, firm and resisting to the feel, which seemed also of a gummatous nature. The ulceration of the throat was extensive, and involved the upper part of the larynx, and was evidently also originally of a gummatous character. The gangrene of the face involved the entire of the soft parts. The heart was, though tolerably firm, small and pale, weighing 4 oz. and 3i; an

ante-mortem firm clot in the right ventricle was of considerable size, and a smaller one in the left. There was no gummatous deposit either on the surface or on the walls of the heart itself.

In these two instances the similar results to the face were remarkable, and in the latter the absence of any cardiac deposit was certified, although in other viscera the gummatous material had been ascertained. In another instance I had the opportunity, however, of assuring myself of this formation on the surface of the heart of an adult patient, and again in the case of a child where the gummatous matter seemed spread over a certain amount of surface on the front of the heart, very similar to " the white spot of Baylee," and in this instance combined with a gummatous deposit on the liver. There is an excellent wax model of both the liver and heart of the child alluded to in the Pathological Museum of the R.C.S.I. It was born evidently syphilitic, but dragged on a miserable cachectic existence for a few months, when it finally

yielded from pure asthenia.   During the last few days of its life
it had become slightly jaundiced, the evidences on the skin were
by no means as marked as in the generality of cases, but from its
birth it was puny and weak.

The following case illustrates the formation of gummatous
tumours on the surface of the heart.   In this instance death was
gradual, and slowly produced, contrary to most of those hitherto
recorded, where death occurred suddenly, and without warning of
any pre-existing cardiac lesion.   In this instance also there can be
no question as to the saturation of the system with the syphilitic
poison, and its external evidences at the time of death.

S. B. (Ward No. 1, bed 6)—Was admitted June 9, 1868,
suffering from leucorrhœal discharge and general debility.   Has
been upwards of twenty years unvirtuous, and eighteen years ago
was treated in hospital for genital sores.   She was then hardly
seventeen years of age, and had ever since led an unvirtuous life,
with its concomitant evils of dissipation, exposure to cold, &c.;
having been five or six times affected by sores, the dates of which
it is not easy to obtain with any reliability, and two or three times
by gonorrhœa, about ten years ago she had a " rash," not to such
an extent as, she remarked, to disfigure her, and which was cured
out of hospital.   She had never observed any other results of the
primary sores, nor till lately suffered in any way from pains, sore
throat, or other well-marked constitutional affections.   She never
took mercury in any form.   On admission she presented the
appearance of one considerably advanced in age, looking many
years older than she really was.   The limbs were very thin; the
neck and face slightly puffed, and of a dingy hue; the lips blueish.
She suffered much from coldness and lassitude.   The breathing
was 22 per minute.   The pulse was remarkably feeble, but regular,
varying from 56 to 66 according to position.   The area of cardiac
dulness was considerably diminished; the impulse also was less
perceptible both to the eye and touch.   There was no abnormal
sound, but diminished intensity of the first.   There was no
evidence of disease of the lungs; the other viscera seemed healthy,
and the liver was not enlarged.   She was now suffering from pains
in the shoulder and knee-joints, thickening of the periosteum of
the left tibia, and the formation of three gummy tumours on the
thigh and one on the shoulder, the latter having nearly proceeded
to ulceration.   She was ordered generous diet, stimulating mixture,
with cinchona, wine, &c., freely.

June 11, 1868.—She complained a good deal of palpitation and precordial uneasiness, and of increasing debility; could not rest. There was no orthopnœa, but the breathing was at times greatly hurried. There was some dilatation and slight pulsation of the right external jugular vein, and a faint murmur over the heart and great vessels. The subsequent history of the case is that of gradually increasing debility. The pulse became feeble, till for several days preceding death it was hardly perceptible, feeling as a mere wave or undulation under the finger. The semi-congested appearance of the face increased notably, but not to an inordinate degree. The heart sounds became more indistinct. There was much irritability of stomach at times, and notwithstanding an abundant use of stimuli and nutrition, finally the patient "died out," without suffering from any special or overwhelming symptom, on July 24, 1868, six and a-half weeks after admission. Two of the gummata had nearly ulcerated, and the pains in the joints had diminished.

On *post-mortem* examination the right side of the heart was found distended, and the organ itself was small, weighing but five ounces, indicating chronic failure of nutrition, as occurs in phthisis, cancer, and other wasting diseases. On opening the right ventricle a large clot, nearly filling the cavity, was to be seen, entangled in and formed around the carnæ columnæ, whitish, very firm, dense, and fleshy-looking. The infundibular portion of the ventricle was quite free from coagulum and empty. The right auricle was distended with a soft, gelatinous, and coloured *post-mortem* clot, extending into the superior vena cava. The left ventricle was of small size and apparently healthy, but towards the apex on the anterior aspect presented one smaller, and two larger elevations or gummatous nodules, both being raised about half a line over the level of the ventricular wall. To the touch they felt firm, and on section were found to penetrate one-fourth into the substance of the ventricular wall. The colour was not the yellow tubercular hue depicted by Ricord in his case (plate 29), but was more of a very pale flesh or cream colour. On making a section, the edge of these deposits was tolerably defined, but at the deeper part, where imbedded in the fleshy substance, was not so plainly discernible. On the posterior aspect of the left ventricle another deposit, smaller but more distinctly marked, was also seen, imbedded in like manner. The cavity contained a small, dense, whitish blood concretion, entangled among the carnæ columnæ. The wall of this ventricle was half-an-inch thick, that of the right was

thinner and denser than usual. There was no valvular lesion what-
ever. The lungs were healthy and contained no deposits. There
were a few old adhesions. The liver was rather small and pale,
not indurated, and presented on the under part and towards the
thin edge three deposits, rather hard, slightly yellow, raised above
the surface, and about the superficies of a fourpenny piece. The
other viscera were healthy.

The occurrence of syphilitic deposit or gummy tumour in the
heart itself, though recognized by Virchow, Ricord, Haldane, and
others, is rarely demonstrated. The formation of these tumours
in the tongue as the prelude to tubercular ulcers, and in the
muscles themselves, is undoubted, having been seen in many of
the large voluntary muscles, such as pectoralis major, sterno-
mastoid, vasti, glutæus maximus, trapezius, &c., analogous to the
well-known gumma of the cellular tissue—one of the latest, but by
no means the least troublesome manifestations of constitutional
infection, commencing as a hard nodule in the cellular tissue, gra-
dually leading to ulceration, and consisting microscopically, accord-
ing to Robin, of "rounded neuclei belonging to fibro-plastic cells,
or 'cytoblastions,' of a finely granular, semi-transparent, or amor-
phous substance, and finally of isolated fibres of cellular tissue, a
small number of elastic fibres, and a few capillary blood vessels."
Bouisson remarks, speaking of syphilitic tumours in the muscles—
"It is difficult to determine whether the earliest change takes
place in the muscular fibrils or in the intervening cellular tissue,
although analogy would lead us to believe that it is the fibro-
cellular element connecting the fleshy fibres or serving as their
sheath that is first involved." On the microscopic examination of
the tumours in this case, the muscular fibres around the section
could be seen of their natural appearance; in the interior they
were few, and surrounded by a homogeneous, dense, structureless
material, in which I did not detect any granules. To the feel
these tumours were firm, and felt to the knife dense and easily
sliced.

The case related and illustrated by Ricord ("Iconographie,"
plate 29) presents a history, as in this instance, of a long-standing
constitutional infection, and its manifestation by the formation of
gummata or external deposits. The patient received his first sore
in 1824, another in 1826; between 1829 and 1834 he had several
sores. In 1834 he got a sore, followed by swelling of the inguinal
glands, succeeded by mucous patches. He remained apparently

cured till 1845, when "tubercules" formed, followed by ulceration, both on the shoulder and penis. While under treatment, and apparently going on favourably, he suddenly died. On *post-mortem* examination the heart was found hypertrophied, the right ventricle containing soft coagula, and its endocardial lining thickened; not so in the left. The walls of both ventricles contained deposits of a yellowish matter, dense, "criant" to the knife, and in some places of a "squirrhoide" consistence, and in others like tubercular matter in the process of softening; "in a word, of syphilitic tubercles, a tertiary evidence often found in the subcutaneous and submucous cellular tissue." "Around these morbid products there was no disturbance, 'refoulment,' of the muscular fibres, for the degeneration was in the substance of the muscular fibre itself."

From the inspection of M. Ricord's plate, the heart, contrary to the condition in this case, was very considerably hypertrophous, and the deposit more abundant and tubercular in appearance.

With regard to this case, it is curious, and illustrative of the modifying effects of the system, that signs of constitutional syphilis showed themselves but once in upwards of twenty years, and that not till a few months before decease did well-marked signs of general infection develop themselves.

As I have had the opportunity of observing these cases both before and after death, they presented some points of interest, in the first case showing the remarkable amelioration in the symptoms of imperfect circulatory power, and in the latter proving the positive deposit of the gummatous material, so characteristic of the later stages of the syphilitic infection.

ART. V.—*Diaphragmatic Pleuritis.* By THOMAS HAYDEN, F.K. & Q.C.P.I., M.R.I.A., Physician to the Mater Misericordiæ Hospital, &c.

THAT diaphragmatic pleurisy is of rare occurrence, is attested by the fact that many experienced and eminent physicians have declared that they had never met with an example of it in the primary form. The novelty of the affection, the obstinacy of its symptoms, and the difficulty occasionally experienced in its diagnosis, have invested the subject with peculiar interest for me, and induced me to keep accurate notes of the examples illustrative of it which have come under my notice. The following records and

brief remarks are the result of my experience and study of the subject:—

CASE I.—*Lumbago, Diaphragmatic Rheumatism,* and *Pleuritis.* Mr. B., aged about 45, temperate and generally healthy, in May 1868 began to suffer from severe pain in the back, which prevented free respiration and motion. When he first came under my notice the pulse was 84, tongue clean, appetite good, no cough. Whilst lying on his back he experienced no pain or respiratory distress, but on attempting to change his posture he groaned with pain which he referred to the lumbar region, but described as extending likewise forward in the line of attachment of the diaphragm; pain of a less severe character, and referred to the same situation, was likewise experienced on making a full inspiration. Treatment— alkaline mixture, turpentine stupe, and flannel swath. After the lapse of a few days his condition was rather worse; frottement was now audible in the inferior left lateral region; dorsal pain was more severe, and extended forwards to the ensiform cartilage in the line of attachment of the diaphragm; he lay upon his back, and experienced no inconvenience as long as he remained at rest and avoided deep inspiration; respiration thoracic; face painfully expressive of apprehended suffering, and on attempting to sit up or otherwise change his posture he involuntarily groaned with pain, and gasped for breath. Pulse not accelerated; no cough or febrile action. Treatment—small doses of mercury, blister to side, to be followed by a warm poultice; an opiate at night. The sedative procured a good night's rest, but in other respects there was no decided improvement. Various measures were now resorted to, including a course of mercury to slight salivation, and subsequently quinine in moderate doses, with only partial success.

After an illness of a month's duration he was enabled, by the use of a broad flannel belt round the chest, with a piece of whalebone stitched into it on each side of the spine, to be out of bed and take gentle walking exercise, the back being curved forwards, the chest prominent, and the arms thrown behind the body. There was no cough, frottement, or thoracic dulness; pain was still urgent on the slightest movement of the body involving contraction of the erector spine muscles, but was now confined to the lumbar region, which was tender to pressure. Dry cupping over the loins, followed by a belladonna plaster, was now made use of, and gave great relief, enabling the patient to walk about on the

following day with comparatively little suffering. A week later he was able to return to his professional duty.

The features of interest in this case were:—

1. The co-existence of lumbar and phrenic rheumatism with phrenic pleuritis.

2. The persistence of pain and of pleural frottement under various plans of treatment.

3. The absence of cough and of pyrexia throughout the illness.

4. The final limitation of pain to its original site, the lumbar muscles; and

5. The benefit ultimately derived from dry cupping, and belladonna to the loins.

The absence of cough and pyrexia is not incompatible with pleuritis. I have met with pulmonary tuberculosis in the stage of softening; chronic pneumonia; and pleuritis (not diaphragmatic), unaccompanied with cough for a considerable period. This is undoubtedly rare; but unattended with bronchial irritation, and associated with a minus state of reflex irritability of the respiratory nerve-centre, the diseases mentioned need not of necessity be accompanied by cough. The absence of pyrexia in superficial acute inflammation, but of limited extent, and accompanied with great suffering, is still less uncommon. The actual existence of frottement in the line of attachment of the diaphragm was conclusive as to the presence of pleuritic inflammation.

Case II.—*Phthisis and Diaphragmatic Pleurisy.*—Mr. C., aged 33, fair, tall and thin, of nervous temperament, phthisical, with tubercular deposition in the upper portion of the right lung, was under observation during the years 1868-69, in the course of which he suffered from cough, occasional hæmoptysis, and circumscribed pleuritis on the right side. In the latter end of December 1869, and whilst frottement was still audible beneath the angle of the scapula, he was attacked with acute pain in the lower portion of the right side in a line corresponding to the edge of the costal cartilages, aggravated by the slightest movement of the body and by full inspiration. This pain was most severe when he attempted to turn in bed, and was described as being of a darting piercing character. At rest in the sitting posture, and breathing tranquilly, he experienced no pain; he was likewise free from pain when he lay on the left side or on the back, but lying on the right side caused much suffering. The abdomen was retracted and motionless

in respiration, which was entirely costal, and over the seat of most acute pain a faint grating sound, intermediate in character between frottement and crepitus, was audible during full respiration. Treatment—a grain of watery extract of opium three times daily, a belladonna plaster to the side, and a flannel swathe to be worn tightly round the lower part of the chest.

After a few weeks he got quite well of these symptoms, and under the joint advice of myself and Dr. Stokes emigrated to San Fransisco.

CASE III.—*Diaphragmatic Pleurisy with Pneumonia.*—On Monday, Nov. 21st, 1870, I visited with Mr. Cahill of Dame-street, Mrs. H., aged 33, and some months pregnant of her fourth child. On the night of the preceding Thursday she was attacked with acute pain in the lower portion of the right side; this became gradually more urgent, and was accompanied with cough and expectoration of blood-stained sputum. Active treatment, including leeching and the administration of mercury, had been used, but this latter it was found necessary to suspend owing to the supervention of diarrhœa; quinine was then given. When first seen by me she seemed greatly distressed, breathing with much difficulty and pain; face flushed; pulse 132, but not weak; respiration 60. An attempted deep inspiration was suddenly arrested with a jerk of the body, accompanied by a loud moan, and an involuntary movement of the hand to the lowest portion of the right side; this she indicated as the seat of excruciating pain, relieved somewhat by firm pressure with the open hand. The lower half of the right side was dull and nearly motionless, no tactile vibration was perceptible, and only a very faint and distant respiratory sound was audible, unaccompanied with crepitus or frottement. The right side was clear anteriorly to the level of hepatic dulness, and there was no displacement of the liver. Leeches were applied to the seat of pain, and afterwards a succession of warm poultices, gr. i. of watery extract of opium was given every third hour, and alternately sulphate of quinia in gr. i. doses. After a protracted illness this patient got quite well.

In this case there was inflammation not only of the diaphragmatic, but likewise of the adjacent portions of the costal and pulmonary pleura; there was also pneumonia of the base of the lung, and serous effusion limited by adhesion to the posterior and inferior portion of the pleural cavity.

Case IV.—At 2 o'clock on the morning of October 19, 1870, I was hastily summoned to an adjacent street to visit Mrs. S., a woman of delicate frame, aged about 50, but not subject to any particular form of illness. She had slight cough for a few days preceding; took her accustomed glass of porter about 10 o'clock the previous night, and immediately retired to bed. About 1 o'clock she was awakened by severe stabbing pain in the lower portion of the left side of the chest, but shooting up to the tip of the shoulder. This pain almost took away her breath, and was accompanied by severe vomiting (first of the porter drunk the preceding night, and then of mucus), which aggravated the pain in the side almost to a point of intolerance; she moaned incessantly, and referred to the line of the left costal cartilages as the seat of excruciating pain which extended to the left shoulder, and down the left side of the abdomen. The surface was cold and palid; pulse scarcely perceptible; tongue moist and clean; breath cold. On attempting to swallow even the smallest quantity of liquid a dragging pain was felt in the left hypochondrium, and vomiting immediately ensued. The pain was aggravated by pressure on the epigastrium, or left hypochondrium. The left side was nearly motionless. There was tympanitic resonance to the level of the left nipple, anteriorly and laterally, and here respiratory sound was in abeyance, but a slight rustle of a harsh character was audible at the end of expiration; posteriorly, very feeble respiratory sound might be heard, and percussion resonance was normal. The heart pulsated in the natural situation, and its action and sounds were rapid, but otherwise of the character usual in health. Mustard cataplasms were applied, and chlorodyne and morphia administered, with the effect of arresting the vomiting and in some degree alleviating the pain. On the following day the bowels were moved by means of an ænema; ice was given in small morsels; a blister was applied along the costal cartilages, and the blistered surface subsequently dressed with mercurial ointment.

Liquid nutriment in small quantities was now borne, and from day to day the patient's condition improved; she still, however, lay immovable on her back; respiration was shallow and accompanied with slight pain, which was much aggravated by the least movement of the body. After a few weeks of ordinary tonic treatment, combined with a sedative at night, this woman got quite well, and returned to her duties as a milliner.

I for some time felt considerable difficulty in arriving at a confident diagnosis in this case. The patient was in a state of collapse when first visited, and this, taken in conjunction with the history, symptoms, and physical signs exhibited, would warrant almost indifferently anyone of the three following conclusions, viz., 1. *Perforation of the pleura* by tubercular abscess of small size, and consequent pneumothorax with empyæma of trivial amount limited to the lower portion of the pleura by previous adhesion. 2. *Diaphragmatic hernia of the stomach*; and 3. *Diaphragmatic pleuritis* of the left side.

In support of the first mentioned view might be adduced the delicate aspect and frame of the patient, previous though slight cough, and extensive tympany in the seat of pain; but then, all the usual metallic phenomena were absent.

The second hypothesis seemed borne out by the sudden occurrence and severe character of the pain; the sensation of ' dragging' in the left hypochondrium on attempting to swallow; the high level of tympanitic resonance on the left side, and its continuity with that of the epigastrium; and lastly, vomiting. But the heart had undergone no displacement.

The third view mentioned, and which was that taken after some hesitation, was sustained by the friction-sound, though faint, audible in the seat of pain; tenderness of the epigastrium and beneath the left costal cartilages; elevated level of gastric tympany; fixed immobility of the left side of the chest in the state of expiration; but chiefly by the *negative* symptoms noted in connexion with the two former hypotheses. All these views were compatible with pain in the shoulder-tip, vomiting, high level of tympanitic resonance, collapse from pain, and pleuritic friction-sound. The phenomenon of hippocratic splashing, so characteristic of pneumothorax with liquid effusion, might have been likewise simulated in the case under consideration by the motion of liquid in the stomach, had it contained any, owing to the unusually high position occupied by that viscus; but the prompt evacuation of the stomach at the outset of the attack, combined with inability to swallow, obviated that source of error. The absence, therefore, of *all* metallic phenomena, including that of hippocratic splashing, which, although it *may* be present from other causes, is rarely absent in hydro-pneumothorax, was regarded as of crucial value in the diagnosis. The elevated position of the stomach might be satisfactorily explained by the assumption that

the left ala of the diaphragm was in a state of temporary paralysis, or rather of suspended contraction, owing to the pain occasioned by its movements; so likewise might the sensation of dragging at the cardia, on attempting to swallow, be accounted for by reference to the momentary but firm contraction upon the œsophagus which the decussating fasciculi of the diaphragm are known to undergo immediately solids or liquids enter the stomach.

The symptoms of diaphragmatic pleurisy, under the designation of "diaphragmitis," are given with much fulness by J. P. Frank, in his great work *De Curandis Hominum Morbis*.[a] Thus, he speaks of deep seated and very acute pain beneath the sternum, costal arch, and in the loins, increased by full respiration, bodily effort, swallowing, and pressure upon the epigastrium, as of frequent occurrence; he likewise mentions anxious expression of face, restlessness, occasional hiccup, shallow, quick, and thoracic breathing, followed by acute fever, but discredits the alleged symptoms of delirium and risus sardonicus.

Corvisart likewise alludes to the subject in the way of correcting errors of interpretation.[b]

Abercrombie gives a brief sketch of an example of the affection,[c] and Andral[d] furnishes the particulars of six cases, with dissections, which are briefly as follows :—

Case I.—A man aged 26, was attacked after a chill with severe pain in the left hypochondrium; breathing was thoracic, and features pinched; there was abortive cough, tenderness in the seat of pain, and delirium. Death took place on the sixth day, and dissection revealed exudation of lymph on the left ala of the diaphragm and on the base of the corresponding lung.

Case II.—A man aged 31, suffering from phthisis, was suddenly seized with severe pain in the right hypochondrium; the breathing was thoracic; the face palid and pinched; there was bilious vomiting and hiccup; pulse and respiration rapid; percussion sound in seat of pain was clear, but respiration inaudible, whilst on the opposite side respiration was puerile. Jaundice

[a] Libr. i., p. 179.
[b] A Treatise on the Diseases and Organic Lesion of the Heart and Great Vessels. Translated by Hebb, p. 8.
[c] Transactions of the Medico-Chirurgical Society of Edinburgh, Vol. i.
[d] Clinique Medicale, Vol. ii., observation 18, et suivantes.

appeared on the sixth day ; the liver was now displaced downwards, and death took place on the twenty-first day. A circumscribed abscess was found between the base of the right lung and the diaphragm.

CASE III.— A phthisical man aged 37, was attacked during an evening exacerbation of hectic with acute pain in the line of the left costal cartilages, accompanied with shallow and quick breathing which was entirely costal ; the pain next extended into the hypochondrium and groin, and the man sank rapidly and died about a month after the date of seizure. Large tubercular cavities were found in both lungs ; the base of the left lung adhered to the diaphragm peripherally, but in the centre these parts were separated by a purulent collection of great size, limited by the surrounding adhesion, but communicating with the abdomen by an opening in the diaphragm of an inch and a half in diameter. The matter seemed to have pushed the peritoneum before it, and to have lodged between the spleen and the abdominal wall, in a large cavity limited by surrounding adhesion.

CASE IV.—A man aged 19, phthisical, complaining of vague pains in left side with dry cough ; lower two-thirds of left side were found dull, with absence of respiratory sound ; ægophony, but no dyspnœa or fever. Five days after admittance into hospital he was suddenly seized with severe pain in the left hypochondrium and groin ; breathing was now costal, and confined to the right side ; pulse quick and weak ; great anxiety ; death on the 16th day. A large quantity of grumous pus was found in the left pleura, and the diaphragm was pushed down on that side below the level of the ribs ; the heart was displaced to the right ; the left pleura, including that of the diaphragm, was covered with false membrane, and the lung was compressed.

CASE V.—A man aged 26, phthisical, and subject to hæmoptysis, with evidence of tuberculosis of the left lung, and a month later of excavation likewise. Eleven days subsequently he was seized with sudden and excruciating pain along the line of the left false ribs ; there were now orthopnœa and pinched features. After a further interval of five days there was evidence of liquid effusion into the left pleura, and death took place a week subsequently. Crude tubercular matter and vomicæ were found in both lungs, and false membrane on the diaphragm, with bands of

the same character extending between the adjacent portions of the costal and pulmonary pleura.

Case VI.—A man aged 30, was suddenly seized with severe pain below the left breast, accompanied with dyspnœa, fever, and dry cough, followed by nocturnal delirium; the face was pinched; decubitus dorsal; breathing quick and shallow; there was dulness on percussion in the left back; two days later he cried out with pain, which he referred to the diaphragm, gasped for breath, and died on the 6th or 7th day. The left lung was found in an advanced stage of pneumonia. There was no liquid effusion, but old adhesions between the costal and pulmonary pleura, and recent adhesion of the base of the lung to the diaphragm.

Dr. Graves[a] details an example of this affection in a child of eight years, who, during convalescence from a mild attack of rheumatism, was frightened, and immediately afterwards was attacked with dyspnœa and symptoms of collapse. There was loss of respiratory sound, with frottement, in the lower portion of the right side; dry hacking cough without expectoration; no pain or tenderness anywhere, and pressure on the right side gave relief. There was likewise precordial fremissement, but nothing abnormal in the sounds of the heart. The right pleura was found covered throughout with false membrane, and the base of the lung was attached to the diaphragm. Two quarts of liquid recently effused occupied the pleural cavity, which was traversed by bands of false membrane connecting the costal with the pulmonary pleura. The base of the lung was carnified from former pneumonia; lymph had been likewise effused on the pleural surface of the left ala of the diaphragm and base of the corresponding lung; the pericardium and heart were normal. Precordial fremissement was probably due, in the opinion of Dr. Graves, to friction of the pericardium against the rough surface of the diaphragm during the strong action of the latter.

In reference to the symptoms mentioned by ancient writers as pathognomonic of paraphrenitis (diaphragmatic pleurisy), namely, risus sardonicus, furious and continued delirium, and convulsions, Corvisart remarks that they "do not belong exclusively to this affection,"[b] adding, " I view many of the symptoms attributed to paraphrenitis not only as equivocal, but even as erroneous."

[a] Dublin Quarterly Journal of Medical Science, Vol. xx., p. 414, Jan. 1, 1842.
[b] Opus citat., p. 8.

The unequivocal symptoms of this affection mentioned by
Andral are, severe pain along the line of the false ribs, aggravated
by pressure, movement of the body, full inspiration and cough;
orthopnœa with inclination of the body forwards; costal respiration;
and anxious expression of face. Those of equivocal value are
nausea, vomiting, hiccup, twitchings of the features, delirium, and
jaundice when the affection is on the right side. The risus
sardonicus of Boerhaave he has never witnessed. Chomel[a] con-
siders the sitting and bent posture, the acute pain, delirium, and
sardonic expression of face, met with in a few cases of diaphrag-
matic pleurisy, as not due to this cause alone, else, he inquires,
why their absence when the entire pleura is engaged, as is usually
the case? In reference to the entire group of symptoms mentioned
by Andral as distinctive of diaphragmatic pleurisy, Dr. Stokes
remarks, " It is obvious that such symptoms as the above do not
necessarily belong to inflammation of the diaphragmatic pleura, as
they are seldom or never met with in ordinary empyæma, when
the whole pleura is equally engaged. On this subject additional
facts are wanted."[b]

It is noteworthy that in all six examples recorded by Andral,
males of middle age were the subjects of the affection. In that
given by Graves the patient was a child of eight years, and, as
remarked by him, some of the characteristic symptoms were absent,
notably that of pain in the side; but there were dyspnœa, rapid
pulse, and collapse; there was likewise loss of respiratory sound,
and frottement in the suspected seat of disease. Of my patients
two were males and two females, and all of middle age. It will
be remarked that in the examples of paralysis of the diaphragm
in connexion with empyæma recorded by Dr. Stokes,[c] the diaphragm
was displaced downwards, but this was manifestly due to the
pressure of purulent collections upon its upper surface, consecutive
to inflammation by contiguity, and paralysis of its muscular
structure.

In two of Andral's cases also, displacement of the diaphragm
by the mechanical pressure of purulent collections upon its pleural
surface had taken place; in one instance (observation 2) by a cir-
cumscribed empyæma on the right; and in the other (observation 4)
by a diffused empyæma on the left side. Inflammation of the

[a] Dictionaire de Médecine, Article Pleuritis.

[b] Diseases of the Chest, 1837.

[c] Dublin Quarterly Journal of Medical Science, Vol. ix.

diaphragmatic pleura had preceded in both these instances, and no doubt, had extended to the muscular substance of the diaphragm, although this is not specially stated to have been the case in the report given by Andral. In ordinary acute pleuritis with liquid effusion, even though copious, displacement of the diaphragm downwards, belongs not to the usual category of symptoms. In numerous instances of recent acute pleuritis I have found one side of the chest full of liquid, without depression of the diaphragm, as determined by the most careful examination; whereas in other instances where the liquid collection was much less, but consisted of pus, displacement of the diaphragm and the adjacent abdominal organs downwards was the result. I have no doubt the difference was due to the character of the preceding inflammation, and the implication of the diaphragm itself in the latter cases.

In the fourth case narrated by me the diaphragm was arched upwards on the affected side, owing, I have no doubt, to "vital" paralysis, or suspended contraction of its muscular substance, and consequent yielding under the pressure of the inflated stomach from below.

The cases of diaphragmatic pleurisy which I have witnessed seem to warrant me in submitting the following conclusions:—

Diaphragmatic pleuritis is characterized by,

1. Sudden and severe pain in either hypochondrium, extending in the line of the costal cartilages, generally likewise down the corresponding side of the abdomen, occasionally upwards to the tip of the shoulder; and aggravated by movement of body, full breathing, cough, and vomiting.

2. Shallow and thoracic breathing; dorsal decubitus; and comparative freedom from pain in the state of rest.

3. Absence of febrile action in mild cases uncomplicated by general pleuritis, pneumonia, perihepatitis, or other form of acute inflammation; and in severe cases, whether complicated or not, symptoms of collapse.

4. Partial or complete suspension of respiratory sound in the base of the lung on the affected side, and faint frottement, or rustling sound, audible with respiration.

5. Inability to swallow; nausea and vomiting, of occasional but rare occurrence, and confined to the most aggravated cases.

6. Displacement of the diaphragm *upwards* in recent cases un-attended with suppurative inflammation, but *downwards* where the antecedent inflammation has proceeded to the formation of pus.

7. Resistance of the symptoms to active treatment; and yielding to dry cupping, the local use of belladonna, and opium internally. Where *upward* displacement of the diaphragm exists, it may be concluded that suppuration has not taken place, that the muscular structure of the diaphragm has not been implicated in the inflammation, or paralysed; and that, *pro tanto*, the case is one of favourable augury. I have not witnessed examples of inability to rest save in the sitting and stooping posture; risus sardonicus; or delirium; and am disposed to regard these alleged symptoms of phrenic pleurisy as of equivocal value, and strictly accidental.
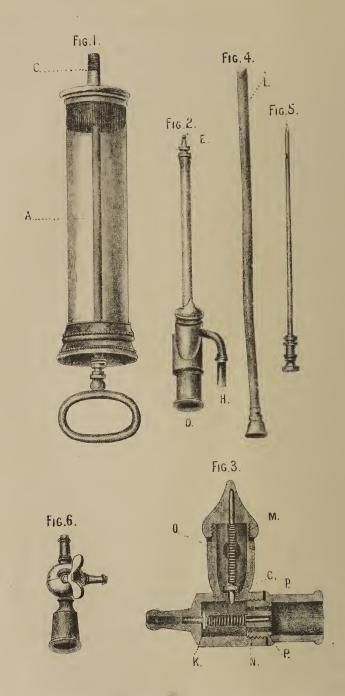
Art. VI.—*On an Aspirator for Use in Thoracentesis, invented by Dr. Vald. Rasmussen, of Copenhagen.* By JOHN WILLIAM MOORE, M.D., Ch.M., Dublin ; L.K.Q.C.P.I ; Ex-Schol. Trinity College, Dublin; Physician to the Molyneux Asylum.

SOME few months ago Dr. Vald. Rasmussen was good enough to ask me to exhibit and describe before the Medical Society of the College of Physicians, Ireland, his newly-invented aspirator. Owing to an unavoidable delay in the transmission of the instrument I was unable to comply with the inventor's wishes. As, however, the modern operation of thoracentesis by means of a subcutaneous aspirator has of late attracted, and is still attracting, so much attention, and as Dieulafoy's instrument—that generally used in the operation—is admittedly imperfect and open to improvement, it may be well to place an illustrated description of the Danish modification of the ordinary aspirator in the hands of the readers of this Journal.

Dr. Rasmussen's " sub-cutaneous aspirator " consists of a glass syringe, to the further extremity of which either the vent-piece to be hereafter described, or a two-water-way stop-cock, can be screwed, this in its turn being connected by means of a caoutchouc tube with a fine lance-headed canula or with a capillary trocar. The distinctive character of the instrument depends, therefore, on the substitution of a two-water-way stop-cock for the two separate and single cocks in Dieulafoy's apparatus; but, more especially, on the insertion of a vent-piece of peculiar mechanism, in the stead of either Dieulafoy's two ordinary stop-cocks, or the two-water-way stop-cock.

In describing the apparatus in detail, I will to a great extent

Fig.1.
C.........
A........

Fig.2.
E.
H.
D.

Fig.4.
L.

Fig.5.

Fig.3.
O.
M.
C.
P.
K.
N.
P.

Fig.6.

follow Dr. Rasmussen's own account of the construction and mechanism of his instrument, as given in the number of the *Hospitals-Tidende* for November 23rd, 1870, page 186. Figure 1 represents the *glass-syringe*, whose cylinder is of thick glass, and incloses a brass piston (*a*). It is capable of holding about $2\frac{1}{4}$ fluid ounces, and to it the vent-piece is fastened by means of an ordinary screw nozzle, (*c*, Fig. 1; and *d*, Fig. 2).

The *vent-piece* depicted in Figure 2, and in section in Figure 3, is composed of two chambers placed at right angles to each other— one forming the continuation of the cavity of the syringe; the other opening into the side of the first. In each chamber is a valve, which consists of a tolerably long pin carrying at its lowest end a small plate (*k*, *c*) covered with soft leather, accurately adapted to the opening. The pin in the first chamber is guided by a spiral-thread, and at its near end passes through a central aperture in a diaphragm made fast screw-fashion (*n*) to the walls of the chamber close to its attachment to the syringe. The second chamber is furnished with a similar " spiral-valve " as it may be called. In this case the pin passes up into a hollow, conical, screw-fastened cover or lid (*m*).

To the further end of the first chamber of the vent-piece is attached a caoutchouc tube from four to five inches in length, which carries at its extremity a tap (*e*, Fig. 2) inserted into the orifice of the *canula*.

With the second chamber of the vent-piece is connected a caoutchouc drainage-tube (*h*, Fig. 2; and *i*, Fig. 4) of any required length.

The *trocars* (Fig. 5) are of four different sizes, varying from three-fourths of a millimetre to two millimetres in diameter.

The mechanism of the valves is easily understood. When the piston of the syringe is raised, the valve of the first chamber is lifted up, and allows the fluid to pass in at *p* (Fig. 3) and so on into the cylinder, while the pressure of the air keeps the valve of the second chamber closed. In pushing down the piston, valve No. 1 is shut and No. 2 is raised by the pressure of the fluid, which is thus allowed to flow into the second chamber, and from it by the orifice *o* (Fig. 3) out into the drainage-tube (*h*, Fig. 2). Should it happen that small fibrinous clots become attached to the valves and interfere with their action, the latter can readily be taken out, cleaned, and re-inserted; or a second set may be kept in reserve for such an emergency. In every case, after use, the valves should be

carefully cleaned, and a drop of oil applied to the leather discs which cover them.

If preferred, a two-water-way stop-cock (Fig. 6) may be substituted for the vent-piece; and it possesses the great advantage that with it the operator can pump either in or out, while the valves permit the fluid to flow only from within outwards.

The most important advantages claimed by Dr. Rasmussen for his instrument are briefly the following :—

1. The operation with it is perfectly free from danger.

2. With it the fluid can be completely drawn off or nearly so, if desired, without the entrance of any air into the pleural cavity.

3. It is possible to remove even the smallest collections of fluid, whether such exist free in the pleura or are encysted.

4. The fluid can be drawn off slowly or quickly, at pleasure.

5. Relapses are far less frequent than after the performance of the ordinary operation of thoracentesis.

6. The instrument is so small that it does not frighten the patient, and the method of using it is so simple that the operator can almost dispense with any assistance.

Note.—The instrument above described may be had of Nyrop, the eminent mechanician of Copenhagen, case included, for a sum of 12 rix-dollars, *i.e.* 27 shillings of our money.
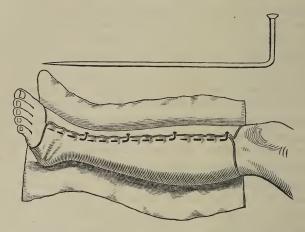
Art. VII.—*On a New Apparatus for the Treatment of Fractures.* By Anthony H. Corley, M.D., F.R.C.S.; Surgeon to Jervis-street Hospital, and Lecturer, Carmichael School of Medicine.

In describing and bringing under the notice of the profession a new mode of using plaster of Paris in the treatment of fractures, I lay no claim to originality. I merely wish to give the publicity which the pages of this Journal afford to a method of treatment which I have found convenient and efficient. A more extended trial will, I am sure, demonstrate its advantages, and that trial I now ask for it.

We are accustomed to summarize the treatment of fractures of the extremities in the four words : *Extension, Counter-extension, Co-aptation,* and *Retention* Every practical surgeon knows and appreciates the difficulty of fulfilling the last of these indications. The variety and multiplicity of splints, bandages, and other means

of retaining the fractured ends in apposition, sufficiently testify to the importance of the object to be secured and the attention bestowed on it. In Jervis-street Hospital, where patients with fractured limbs are admitted almost daily, it is a matter of necessity to practise some method of treatment which will do full justice to the sufferer, whilst involving the least trouble and loss of time to the surgeon. Since the introduction of starch and plaster of Paris bandages, the benefits conferred by these have been freely taken advantage of, but their use in the ordinary way is attended with very serious objections. The first of these is the trouble and time spent in their application; and the next, a still stronger argument against them, is the difficulty of *taking them off*. Even with the facilities afforded by Seutin's Pliers and other resources, the removal of the rigid apparatus is a work of much difficulty. This makes the surgeon unwilling to apply it until the fracture is so far consolidated as to no longer require frequent inspection. In the institution named, neither starch nor gypsum is ever used until about three weeks from the date of the accident, and in most cases during that entire period the patient is confined to one position. Starch bandages, &c., have the great disadvantage of requiring some days to harden, and unless the fractured bone be tolerably well united, or the most constant attention be paid during the time of drying, the ultimate removal of the apparatus may disclose a deformity which is for the remainder of the patient's life a practical illustration of careless surgery. Gypsum hardens at once, but has the same defect in difficulty of removal, and cannot therefore be applied until the period before referred to. The irksomeness and even danger attendant on confinement to a constrained position can scarcely be over-rated, especially in old people, and the chief advantages of the apparatus which I am about to describe are, that it can be used at a much earlier period, and that when applied the patient may lie in almost any position.

In the appendix to the *Army Medical Report* for 1869 (just published), it is described, with an illustration, by Staff-Assistant Surgeon Moffitt, who states that it is used by the Bavarian Ambulance Corps. To make my description more plain, I submit the accompanying engraving by Mr. Oldham, in which some mistakes in the original cut are avoided. Two pieces of flannel, suited to the length of the limb, are cut sufficiently wide to overlap slightly in front. When so prepared they resemble the leg of a stocking cut vertically. One is now laid over the other, and

they are stitched together from top to bottom, down the mesial line, like two sheets of note paper stitched at the fold. They must now be spread out under the injured limb so that the line of stitching corresponds to the back of the calf. The two inner leaves, so to speak, are now brought together over the shin and fastened by long pins, the heads of which are bent as represented by the

full sized one in the illustration. The leg being held firmly, an assistant mixes the plaster with about an equal bulk of water and rapidly applies it, partly with a spoon and partly pouring over the outer surface of flannel *covering the limb.* The two portions of the second layer are then quickly brought over, so as to meet, and the inequalities in the distribution of the plaster are removed before it hardens, by smoothing with the hand. In about three minutes the gypsum sets and the limb is encased in a strong, rigid covering, which gives uniform pressure and support to every part. The edges of the flannel in front can now be trimmed, and the pins withdrawn from the inner layer by seizing their bent heads. A couple of straps or a few turns of a roller make all secure. In order to take the apparatus off it is only necessary to remove the straps, and separate the edges of the flannel, when the two sides will fall asunder, the line of stitching behind acting as a hinge.

The application takes less than ten minutes, the removal about two. Thus, from day to day if necessary, the limb can be inspected, and the splints (for they are no less) re-applied. In cases of compound fracture an opening suitable to the wound may easily

be made. In most cases it is desirable to make a number of per-
forations with a gimlet, so as to prevent unnecessary heat. The
following cases treated within the last month, or still under treat-
ment, illustrate its efficiency:—

Case No. 1.—Simple fracture of fibula immediately above the
malleolus. In this case the patient, a restless, uneasy, middle-
aged man, could not be induced to keep his leg in a box or splints,
but when the plaster and flannel were applied he expressed the
greatest satisfaction. As he was a tailor by trade, and not re-
quiring to stand or walk, I allowed him to leave the hospital at the
end of a fortnight, with instructions to wear the plaster for a
month.

Case No. 2.—Fracture of fibula about its centre in a young
boy. Apparatus applied at the end of a week, and in a few days
he was able to walk with crutches.

Case No. 3.—Oblique fracture of both bones of leg in lower
third, much shortening, rotatory deformity, ecchymosis and swelling,
This last sign was so marked that it was not deemed judicious to
apply the Bavarian apparatus until the 15th day. The patient, a
man about forty years of age, experienced much relief, could keep
the limb in any position, and move it so freely that he complained
of the weight of the apparatus interfering with his movements.

Case No. 4.—Fracture of both bones of leg immediately above
ankle-joint, with much twisting inwards of the foot. For the same
reason as in the last case the plaster was not applied until the
twelfth day. While the plaster was setting the foot was kept
turned in the requisite direction, and in hardening the correct
position was retained. The patient, a young girl, felt quite com-
fortable in a few minutes.

Two of the above cases, with others since admitted, are still
under treatment. In conclusion, I believe it will be found that the
thanks of the profession are due to Dr. Moffitt for introducing
such a valuable adjunct to surgical appliances.

Art. VIII.—*Some Remarks on Structure and Function, in Advocacy of the Spiritual Origin and Direction of Life, in Contradistinction to Blind Brute Force and Automatic Will.* By Henry MacCormac, M.D. Part II.

Invisible laws pervade the universe and govern the infinite diversity of being. Everywhere there are co-ordination and adjustment, everywhere there is submission to rule. By law I merely mean the continual moving and working of God either in person or as confided to some delegated agency.[a] Life and being then, in other words the visible will of God, precede attend and build up the organism. I can imagine no other potency, direct or indirect, adequate to compass so wonderful a result whatever. Life, in respect of its beginnings its continuance and its direction, then I submit is under the control of an invisible power. This power originates, this power brings it to a close after a certain lapse of time. Force is not only innate, it also is created. It is so in the case of vital muscular action, through the souls direct volition throughout all the vicissitudes of material life, in man and brute alike, a power lent to man by God who exercises it at all times. The sun, without whose energy we could not for an instant subsist, or be, is not losing that energy by dissipation or otherwise, as some I think most groundlessly, imagine.[b] Force then is subject to the same moral spiritual control as are the other phenomena of the universe, and like them must continue to subsist so long as it is the Creator and Originators will that, in respect of the manifestations which we witness, it shall endure.

How could the unwitting experienceless idealess soul, as imagined by the younger Fichté, Schelling, Morell and others, build up the organism. The supposition to my conception at least, is at once baseless, extravagant, and, if not unimaginable, at least impossible. It is the Deity who alone builds up the organism and no other power. The unconscious intelligence, indeed, failing impressions from the outer world, is no more equal to the office of organizing and developing the body than it is of organizing and developing itself. Commenting on the Harveian oration for 1870, Dr. Lionel

a Frobschammer, The Papacy and National Life, Contemporary Review, October, 1870.

b Thomson and Tait, Treatise on Natural Philosophy.

Beale observes that the orator supports the views of those who hold that life is a form or mode of ordinary force. He, Dr. Beale, would apply the term vital power to the marvellous agency which, besides giving rise to form, effects the analogies of compounds and re-arrangement of their elements so that, when the synthesis ensues, compounds result which did not subsist before. These complex processes are performed as it were in a moment, but without our cumbrous means and appliances, and the result is simply perfection. Through the agency of an unseen power, certain minute and apparently structureless materials become in one case a man, in the other a creature remote as is possible from humanity. It is a power which controls physics or φυσις, but which in itself is apart from physics utterly. These results indeed, as van der Hœven tells us, are no chance result or play of outward forces.[a] There is from the first an organic plan, and the order of primogeniture of the organs is in harmony with the importance of the zoological characters to which the structures will give rise.[b] The soft transparent material, observes Beale further, takes up and assimilates other material, undergoes division and subdivision, not only in man but in the simplest living thing, in virtue of laws peculiar to living matter and quite unknown to matter in any other state. It is wondrous, it is marvellous, it is sublime. Each species has its constant line of action and, a narrow margin for variation excepted, its immutable rule of existence. It never was, it never will be, otherwise. For thus it was at the beginning, and thus it will be to the end. Order, purpose, law, these are without change or shadow of change. The pendulum of existence swings ceaselessly, but if it do, it observes like curves and equal times. The arrangements of animal life are the joy and satisfaction of the observer, indeed a perpetual source of astonishment and delight. And yet the visible outward arrangements are vastly less wondrous than are those which we do not behold. I speak of consciousness, will, self-direction, in a word of spontaneity or what seems spontaneity of will and action. It seems impossible to concede and just as difficult to deny the operation and existence of an intellectual consciousness and perception in gnat or fly, and

[a] Die constanten Formen, speaking of the infusoria so named, der Arten widersprechen der Ansicht dass diese Thierformen alsein blösses Spiel des Zufalls durch äussere Krafte entstehen. Naturgeschichte der Wirbellosen Thiere, Zwiete Ausgabe B. i. 45.

[b] Milne Edwards, Lessons on Physiology, English tr.

that such consciousness can subsist and undergo division in the polypus or the worm. And yet the humblest insect is amply competent to provide for its conservancy and to carry out its purposes. Present but a finger to a fly, the minute woodlouse that flits across your page, and *instanter* it shifts its ground, its life and action at once are modified by yours. The amazing the stupendous fact is there that, somehow or other the creature possesses self-direction and a will but, as to the immediate how and why, we know absolutely no more than does the creature itself. I am inclined nay forced to ascribe it to an acting intelligence which is not innate but beyond. In fact, in respect of certain so termed instinctive and other acts, acts incessant and almost as regular and unerring in their recurrence as are the phenomena of gravity or light, acts exclusive of and anterior to all experience, we must needs think so. Mind and will, in truth a concurrent and consenting action are at work which the insect, we cannot conceive how, shares and of which it is somehow possessed. Than this, humanity itself and mans faculties aside, there is not I opine in nature anything more noteworthy or remarkable. The qualities which inferior creatures display are wonderful indeed, but then, with faint exceptions, they are not generated and self-developed as in man. They derive, in fact, from a source beyond these beings themselves. Instincts, without culture or instruction, are subsistent in the brute, instincts some of which, to a certain limited extent, may be superinduced and even become hereditary. But it is not so with man. It is the utterest misconception, as some are prone to do, to imagine it. Man, in truth, is not endowed with instincts in the sense that brutes are. A few animal impulses excepted, they do not, as in the brute, directly implicate his intellectual life and moral spontaneity. These remarks premised, nothing I think impresses one with a larger measure of astonishment than the prompt conformity of body and mind, or what we so term, in all classes of creatures, to the will. On the very instant, were it, the obedient organs and faculties, we are in utterest ignorance how, respond. Nay, they seem anxious, so to speak, to submit themselves to every the slightest dictate of our volitions. Even amid the touching spectacle of the partial ruin of the noble handiwork of God, where the poor palsied limb default of direct flexion and extension is thrown forward by the swing of the trunk, the parts will endeavour to obey. Instinct indeed, in some respects, seems to have the advantage over reason. A week hardly passes in which,

default of more cautious guidance, we do not hear of some shocking collision in shore or on the great deep, whereas, predaceous acts excepted, we do not find that the lower orders of creation, amid all their swarming evolutions, ever clash. Migratory animals, insects, fish, quadrupeds, and birds are found to pursue their pre-designed path with a constancy and firmness of purpose which man himself is not always found to equal. One night, far far amid the tropic seas, happening to look over the side, I beheld an army of fish, countless as the sands, silver bright, heading in one direction, throughout all the watches of the night, persistently unswervingly. I have seen the ant swarms in Africa, the pigeon flights in America, as they pursued their way with unflagging constancy. On one occasion, the angel shark or *lophius piscatorius*, apparently, followed the ship for four successive days and nights. It swam with infinite ease, rolling and flapping its way along, so as at times to display somewhat of the white under surface, while sucking fish, its parasites, occasionally swam free, then attached themselves afresh to the monster. What purpose, what force or will must, I thought, have actuated it, for hundreds on hundreds of miles, during all those days and nights, thus to follow us unremittingly.

Some divide the animal world into six primary forms or types of structure protozoa, namely, cœlenterata, annuloida, mollusca, and vertebrates proper.[a] In the vertebrates subsist four limbs, a spinal column if not a notochord or *chorda dorsalis*. This is developed in the floor of the primitive groove of the embryo, but, in fact, is only found to subsist in the lancelot or amphioxus through life. In none of the vertebrates does the gullet perforate the main nervous masses, whereas, in most of the invertebrates there is an œsophogeal nerve collar, so called. In other respects, the main masses of the nervous system, brain nerves spinal marrow cerebro-spinal axis and sympathetic, are in vertebrates isolated from the general cavity of the body. The protozoa have no distinct organs of sense. Amœbas, bereft of any manifest excretory or breathing apparatus, nevertheless move about and procure sustenance. Polygastria appropriate dead organic particles, then become the food of rotifera. These are devoured by vermes and crustaceans which, in their turn, become the prey of fishes, and thus finally the pabulum of man. From the protozoa we pass on one side by the rotifera and their allies, to

---

[a] Nicholson, Advanced Text-book of Zoology, p. 15.

annelids echinoderms crustaceous insects and, on the other, by the
cœlenterata to the molluscs and molluscoids, the greater size of
the latter equipoising the vastly more numerous species of the
former.   While certain classes and orders are inconveniently large,
there are whole families which vary from a single genus, including
a solitary species, to an array of perhaps more than a thousand
genera, for example the cerambycidæ and curculionidæ in the
coleoptera.[a]   The five sub-kingdoms of protozoa cœlenterata annu-
loida annulosa and mollusca composed Lamarks great division of
invertebrata, the remaining members of the animal kingdom con-
stituting the one family of vertebrata.   In fact, a vast and wondrous
variety of organisms, all however referable to a few leading type,
subsist for a period then give place to others similar.   Thus has
it been for a period of which we cannot fix the beginning, and to
which we can assign no close.

As contrasted with the almost inconceivably remote periods
revealed by geology, the birth of man seems recent indeed.   And,
yet, the relatively great antiquity of our race appears to be among
the best established results of recent investigation.   Remote, how-
ever, as that antiquity may prove, I would not, for one, ascribe
the origin of species in general or of man in especial, to the arrest
or progress of development of one and the same organic molecule
atom or protoplasm, on the principle of natural selection, the last
new philosophical toy launched by Lamark Oken Gœthe, and
followed up by Darwin and others.   Nor would I with Hæckel,
ascribe it to some primitive structureless *monera* or *protamœba*, of
possible spontaneous development or abiogenesis, running through
some two and twenty mutations, quadrumanous ape men and
man apes constituting, this eccentric speculator would have us to
believe, our almost immediate predecessors and anthropoid ancestors.
It is as true as that the monistic philosophy, as he terms it, by its
ennobling influence is to elevate our race.[b]   The incipient stages
of useful structures and co-existence of closely similar structures
of diverse origin cannot be explained on the theory of natural
selection.   Specific differences may be developed suddenly instead
of gradually, while species have definite if different limits to their
variability.[c]   There is also an occasional reversion to type.

[a] Moore, On the Invertebrate Collection in the Free Museum Liverpool, Nature, 12
Jan. 1871.

[b] Veredelnden Einfluss.   Naturliche Schöpfungsgeschichte, S. 658.

[c] St. George Mivart, Genesis of Species.

Hybrids between varieties of the same species, too, are usually fertile, while hybrids between distinct species are quite otherwise. Mr. Darwins most recent conclusions, however, are more extravagant than any language at my disposal can sufficiently characterize. Man's early progenitors, he tells us, were no doubt hairy, both sexes bearded, with tails and pointed ears. The great artery and nerve of the humerus ran through a supra-condyloid foramen. The cæcum was larger, the foot prehensile, the habits arboreal. Great canine teeth, to bite withal, adorned the man. The uterus was double, and the eye provided with a nictitating membrane or third lid. At a period yet earlier, man he continues, was aquatic in his habits, our lungs in truth being no other than a modified swim-bladder or float, the clefts in the neck of the embryo showing where the branchiæ once subsisted, while instead of a *medulla spinalis* there was a *chorda dorsalis* as in the lancelet, while the heart was just a simple pulsating vessel, and the creature itself androgynous, $\varkappa. \tau. \lambda.$[a] In fact, no alteration of or in the circumstances of existence, no abiogenesis Huxley's caution, himself regarded, notwithstanding, ever has taken place in the past or will ever take place in the future.[b] Not only in the perfect state but in the earliest stages of development, does the vertebrate animal differ from the invertebrate. The organs of the vertebrate, in the course of formation, do not pass through conditions identical with those which subsist during the formation of annelids molluscs radiates.[c] Man did not begin his career as a worm, then become in succession mollusc fish or ape before he was man. These serial transformations whose different terms, we are told, represent the different inferior types of the zoological tree, may be safely relegated to that limbo from whose fertile soil they sprung.

No heat light or electricity, no physical force or matter, no mere interior or exterior material condition, whatever, without the consensus of an unseen spiritual power will, *per se*, evolve were it the very humblest form of animal life. Vital action is distinct from brute force, quite, is separated from mere matter and its laws by a gulf more impassable than Acheron itself. Force and matter are but tools in the great designer's hands.[d] Heat light electricity and gravity are not themselves vital powers, although in what we term

[a] On the Descent of Man, passim.
[b] Address to the British Association, Liverpool 1870, p. 16.
[c] Milne Edwards, Lessons on Physiology.
[d] Dr. Lionel S. Beale, The Mystery of Life, London, 1871, passim.

life they become subject to its control.   Life controls these powers even without the intervention of the will, and that the will, in certain particulars, can control them, as in muscular effort, may be witnessed in almost every action of existence.   I would have each teacher to lecture with such a work as Beales beside him, I would place it in every learners hands.   Why in truth relegate to quite gratuitous transmutations and imaginary creative forces, automatic and self-subsistent, phenomena which alone can be explained by reference to the soul expanding appreciation of final purposes evinced in the fecund varieties of animated structures drawing us ever nearer to the great First Cause.[a]   Whatever may prove the influence of circumstances in retarding modifying or advancing species and even races,[b] it does not convert one form of life into another nor does it for a moment justify the strange wild inference that all forms of existence are derived from one primary structureless monad.   But monads themselves, ascribing to them volition and life, are no more the results of automatic force than is an elephant or a ship.   Something must originate, something must direct, there must, as Beale observes, be at once intelligence and will.[c]   Crystals, as he well remarks, may be dissolved and re-appear, but dissolve a monad or a man and, short of Almighty power, he does not appear again. Yield to mere mechanical cosmical forces the origination and direction of life, abolish all invisible directing agencies, assume the spontaneity of animal origin and then, but not till then, shall we concede the absurdity of teleology, with the supremacy of principles blind and unintelligent.

In breaking down the barrier between brute and man, lowering the latter to the level of the former, M. Hæckel seems unaware that the brute is devoid of all voluntary introspection, has no uninstinctive knowledge or at least a very feeble knowledge of causation, anticipates no future, has little perception of moral good or evil, does not reck of death, has not the faintest idea of God. He, Hæckel, does no more than justice to his warm affections, but makes too much account of imperfect reasoning powers which, although culturable, can by no process of culture be effectively approximated to those of man.   I should like, indeed, to see the man ape or ape man who, with all the tuition imaginable, should

[a] Jonathan Couch, British Fishes, Vol. i., p. 4.
[b] Criticisms on Darwins Origin of Species.
[c] Mystery of Life, p. 30.

approach M. Hæckel himself, in intelligence. *Fiat experimentum.*
It is one that, even in his hands, would not succeed. M. Hæckel,
in fact, displays more zeal in behalf of his quadrumanous anthro-
poids, than he does in respect of his own species. He does not
seem to see that the world is not God and that the brain is a thing
apart wholly from that divinest principle which we term the soul of
man. He would even sustain the mad position, which he puts in
the mouth of the Missionary Morlang, that there are in fact men
beneath the very brute in possible culture and intelligence,[a] and
that the dark races of South Africa, of whom he gives the falsest
and most hideous portraitures, are but a step in advance of the
ape.[b] Indeed many of the dark men whom I saw in West Africa,
despite of their imperfect culture, I found to display great goodness
and intelligence. Some of them knew more than one language,
and, in addition to their own, spoke and wrote Arabic. Others
were able artificers in iron and gold. Speaking of one who knew
five different tongues, a traveller says, but this is not a remarkable
feat in these lands. Elsewhere, discoursing of the black man, he
observes, his intelligence is surprising when compared with that of
the uneducated English peasant.[c] What might it not indeed
become had the white races been only as much bent on raising and
improving, instead of enslaving and brutalizing him. Wallace, not
to mention others, adduces remarkable examples of moral progress
on the part of races whom we are only too prone to look upon as
uncultivated and uncultivatable.[d] I have seen persons of colour in
West Africa who would contrast favourably with any people. The
children and young folk I thought, were often, especially bright
and intelligent. Nature, in other words the Divinity, in truth,
yields, I believe, to all men, without distinction of place or race,
mainly equal moral and intellectual powers and like capacities.
Nervous energies and the souls receptivity I hold as at least on a
par in savage as in civilized life. There is no such thing as a
specially inherited intellectual and civilized life, moral capacities.
African or Papuan youth, if only early taken and subjected to the
continuous discipline of some good English family school and uni-
versity, would fully equal the ordinary graduate or youth of middle

[a] Dass man eher die bildungsfähigen Hausthiere als diese unvernünftigen viehischen
Menschen zu einem gesitteten Kultusleben erziehen könne. Op. Citat. S. 655.
[b] Bleek, Study of Languages, Introduction, Davidson tr. New York, 1869.
[c] Burton, Lake Regions of Central Africa. Vols. i. and ii.
[d] Wallace, Malay Archipelago, Notes.

class training. I have seen men and women in Africa who were perfect models of human beauty and natural grace, whereas M. Hæckels portraiture of men whom he cannot have seen and whom he does not know, is revolting as his general estimate is unjust and untrue.[a] But so much for theories which make life, all life, spring from originally single germs, and which require that the natural history of man and of species should be distorted and perverted in order to meet their requirements.

Mr. Darwin in his last manifesto observes,—If then the vertebrates be descended from an animal allied to the present ascidians, many normal and abnormal vital processes, which run their course according to lunar periods, will be rendered intelligible.[b] This supposition which he would connect with recurrent periods, the rise and fall of tides, more or less abounding nutriment, and transmitted tendencies, is far fetched and baseless, indeed, and therefore so much the more fitted to associate with the development theory and that of the origin of species themselves. M. Hæckels fancy however, wherein, if such a thing be possible, he out Darwins Darwin himself, is not so much for the bottle bodied ascidians as for a *monera*. But living beings, vertebrates and others, do not spring from ascidians or moneras either. Every rational showing is dead against the assumption. Agassiz, no mean authority, is opposed.[c] The very first step in the process, spontaneous generation namely, is entirely absent. It was ever so. No, not even a monera can come into existence without a precursor. Huxley, with his clear incisive intelligence, refuses abiogenesis his assent.[d] Abiogenesis, indeed. Just as readily might an elephant as a monera be begotten of dirt and slime. For how can matter or force or necessity beget life, much more intelligence and faith and hope and love. It is inconceivable utterly. Van der Hoeven concedes varieties, but does not, with Hæckel, admit diversities of species in man, much less contend for inevitable degradation and brute inferiority.[e] Humboldts testimony is yet more explicit even.[f]

[a] Den Neger halte ich für eine niedere menschenast. Op citat., p. 655.

[b] Descent of Man and Selection in Relation to Sex. Lond. 1871.

[c] Essay on Classification.

[d] Reply to Dr. Bastian.

[e] Da der Mensch vollständiges als irgend ein anderes Geschöpf über den ganzen Erdball verbreitet ist, so giebt es auch innerhalb des Menschengeschlectes sehr zallreiche varietäten die sich theilweise wenigsten aus der Einwirkung des Klima und der Lebensweise erklären lassen—Für die Annahme verschiedener Menschenspecies giebt uns die Naturgeschichte, nach meiner Ansicht, kein Grund. Handbuch der Zoologie, Band ii., S 799.

[f] Indem wir die Einheit des Menschengeschlechtes behaupten, widerstreben wir auch

While we maintain the unity of man let us, he exclaims, reject the joyless conception of higher and lower races of human kind. Although some through culture prove more ennobled, none are of nobler nature than the rest. Whatever Darwin or his adherents may allege, living organisms man and brute alike, as Creations records plainly tell, were formed if not precisely in all essentials as they now stand. No monera, no ascidian, was or ever will be, developed into the likeness of a man. Consciousness is not the result of blind force. To create, as to continue in existence, involves an equal although unseen spiritual direction, along with the same instant exercise of divinest wisdom and power.

The science of structure, special and general, human and comparative, is not confined in its applications to man only, but extends to all creatures, every organism. Analogies, closer even than what might be imagined, connect the four great classes of radiata articulata mollusca and vertebrata. But by far the closest resemblances subsist among the vertebrates themselves. Human anatomy for many reasons, must however, hold the highest place. Some go so far indeed, and I think with great reason, as to erect our species into a separate class, *homines*. But this apart, the anatomy of every creature is first of moment in regard of itself, then in respect of its position in the immense circuit of the manifestations of vitality also. How miraculous, how wonderful, that a little carbon hydrogen and oxygen, coupled with a trifle of sulphur lime phosphorus and iron, changed indeed continually, should, even under the coercion of unspeakable wisdom and power and skill, come to display aspects of grace and beauty and perfection well nigh infinite. It almost transcends conception, it is to be adequately measured by no tongue.[a] To say nothing of the visible there is, to the naked eye at least, the invisible world of rotifera entomostraca infusoria and protozoa all entirely unknown for countless years.[b] The floscularia most beautiful of animalcules, the one-eyed *notommata lacinulata*, the housebuilding melicerta not bigger than a pen point, and others all as if they existed not, because they were unseen.

jeder unerfreulichen Annahme von höhern und niedern Menschenracen. Es egiebt bildsamere, hoher gebildete durch geistige cultur veredelte, aber Keime edlere Volkstämme. Kosmos.

[a] Die Natur hat in dem Baue des thiereschen Körpers eine unbegriefliche Kunstfertigkeit an den Tag gelegt. Nichtnur der Körper im Ganzen, ja nicht nur seine gröberen Theile, sondern selbst die kleinsten Theile der Organe sind Wirkzeuge. Van der Hoeven, Naturgeschichte, S. 9.

[b] Gosse, Romance of Natural History, 8th ed. 1st series, p. 140.

Anatomy, in truth, has done much for philosophy, as well as for the natural history of brutes and man. All too long proscribed, it has freed the mind from many an error and gross superstition.[a] Coupled with physiology, it co-ordinates the facts of animal life and structure. From it we learn that the blood of vertebrates is red the amphioxus, in which however the endoskeleton is replaced by a rodlike aggregate of cells known as the *chorda dorsalis*, excepted.[b] By right the habits of animals should be considered by the philosopher, as well as their mere structure by the anatomist. All the wondrous wiles and stratagems of man, it is interesting to observe, were practised countless ages before he came into existence by the brute. Animals indeed everywhere display the evidence of an over intelligence, a spiritual insight, extrinsic to and beyond themselves, to such a degree in truth, that some, mistaking its source, have imagined that they too should subsist, recipients of divinest light and love, for ever.[c] How singular too, as determined by, at least as connected with, philosophical anatomy or that the anterior or upper extremities in man, in him at least, not only cease to be organs of locomotion, but are converted into implements of intelligence, in a word, servants of the soul. And, yet, it is not so much the hand which has made the mind, as the mind the hand. Even without hands man would still be man but, ah, how different. In other respects, as Haughton and others have cogently remarked, no anatomical element serves to explain the profound intellectual, to which I may add moral, difference that subsists between the brute and the man.[d] Commonly, the structure of the parts, as for example, the hollow bones in respect of the respiration in birds, explains their after destination. In human beings however, predetermined uses may be modified to a certain extent almost to infinity, by our wants, our humours, our caprices, and our culture. Nerve structure in man and brute, at least keeping to the vertebrates, so far as we can detect, is completely alike, and yet, as I must again repeat, how different, in respect of powers adaptabilities and destinations, are brutes and men.

The too prevalent ignorance in regard of the very simplest laws and requirements of animal life, is very greatly to be deplored. The approximately careful study of zoology, at least in the ordinary

[a] Milne Edwards, Zoology, Knoxs tr. p. 388.

[b] Rolleston, Forms of Animal Life, p. xxxii.

[c] Wood, Common Objects of the Country, p. 22.

[d] Three Kingdoms of Nature, p. 213.

living types, should prove an essential ingredient in the education
of the young.   It is treason to the majesty of our nature, and
indeed nature at large, to shut ourselves out from all or almost all
insight into the unutterably wondrous marvels of the unspeakably
beautiful handiwork of God.   They must, in a sense, be seen felt
handled tested, else no tongue or pen of man is adequate to do them
even approximate justice.   In an economic point of view, the science
of zoology is of the greatest moment, our sustentation, nay our every
day life and action, is closely bound up with the kingdom of the
brute.   Zoology and biology are one.   Names for the same thing,
they implicate alike the dominion of nature and the economy of
life.   The conditions of existences of the lower animals, their
murrains epizooties and casual ailments, concern us immensely.
Food unfitted for human use, and thrust into fraudulent consump-
tion is too often rife with the elements of disease and death.[a]
Microscopic ova gain access to drinking waters, feculence dried up
and ground by the wind is inhaled, ascarides trichinæ tapeworm
and other vermin, increasing as some of them are found to do by
gemmation fission geneagenesis and what not, ravage our vitals and
entail destruction.   The larvæ of flies and other insects have been
known to gain access to wounds, and even to infest the nasal and
other outlets, entailing sufferings that will not bear description.   I
find it stated in the current journals of the day that numbers of
sheep having recently perished in various parts of Devon and Corn-
wall, it was ascertained by Mr. Tucker that it was owing to the
presence of the larvæ of the gadfly in the nasal passages.   The
ravages from the distoma or fluke in the same important animal are
too notorious to need insisting upon.   All this however is as almost
nothing when contrasted with the conduct of the insect tribes
without.   Parasites indeed attack our food plants, the scolytus
assails fruit-bearing and other trees, nay some are found to consume
the sustenance of a province in a night.   The *acridium peregrinum*
or migratory locust, is as an army in its ravages.   It comes in hosts
numerous as the very sands, appearing in some places after intervals
of seventeen years in force.[b]   Dead, their decaying remains poison
the atmosphere and even engender pestilence.   In 1824, the *gryllus*

---

[a] Das Fleisch der Thiere, durch die Krankheit voran sie starban oder in welcher sie
geschlachtet wurden, kann dem Menschen verderblich werden.   Rudolphi, Grundriss
der Physiologie, Band ii., S. 21.

[b] Thoreau, Letters, Boston U. S., p. 31.   The seventeen year locust.

migratorius was gathered in sackfuls near Marseilles.[a]   The cock-
chafer is alike destructive whether as grub or insect.   Corn weevils,
the *calandra granaria* and its analogue the rice weevil, *calandra
oryzae*, are suffered to ravage granaries, though a little of the bisul-
phide of carbon destroys them at once and without injuring, so
volatile is it, the grain.   I have been in a ship wherein every inch
of biscuit was infested by the grubs, which the lighthearted sailors
termed bargemen, of this disgusting insect.   The giant sirex, *sirex
giganteus*, chews lead, as was shown in French bullets in the
Crimea.[b]   The pine tree has many enemies, among the rest the
phalaena bombix pinivora, the pine twister *tortrix turionata*, *tortrix
strobiliana* or cone pyralis.   The *bombyx dispar*, which also ravages
the pine, shields its eggs with down from its own body, while the
gall insect, through an instinct ruled and willed by God, actually
uses its own person for the purpose.   Indeed, instinct is no other
than a name for divinest wisdom and power.   Those who have not
visited the tropics can form little idea of what we term the prodigality
of insect life, with occasional drawbacks, subserving the wisest
purposes and needful absolutely.   The very earth, as a metaphysical
writer once observed[c] is covered with intelligence as with a veil.   The
ants, or woodeaters of Africa and South America, abound in prodi-
gious numbers as was needful for their purposes.   At periods of four
years or so they come forth in perfect multitudes gobbling up snakes
reptiles cockroaches and, as I learned on the spot, even putting man
himself to flight at times.   In 1731, the teredos nearly overwhelmed
Holland.   The lemmings of Lapland, not bigger than mice, issue
forth in hosts, unnumbered numberless.   Lemurs hamsters crabs,
and other errant creatures, take periodically to the road.   A walking
rodent of Siberia, the *lagomys pika*, makes hay.   Birds, as pigeons,
swarm.   Fishes, countless as the stars, come and go.   The zimb of
Abyssinia and tsetse of Mid Africa, tabanidae of different species,
often render the safekeeping of domestic animals a matter of the
greatest difficulty.   Egypt is not the only land of flies, the country
of the Amoor and the lower levels of Lapland, at certain seasons
are so infested as to render life all but intolerable to man and his
immediate dependents.   I used in America to watch the mosquitos,
in a little water taken up in a tumbler, breaking out from their
pupa case, unfolding and trimming their gauzy wings as they clung

a Van der Hoeven, Naturgeschichte der Wirbellosen Thiere, s. 438.

b Pouchet, The Universe, English tr., p. 215.

c Fearn, A Manual of the Physiology of the Mind.

to their exuvial, a wondrous spectacle. A very singular creature is the *stratiomys chameleon*, dwelling nigh Paris, which begins its career as a sort of flat waterworm, breathing through trachiæ, then shedding its larva envelop, and becoming a large dipterous fly as described by Réaumur and Swammerdam. The white winged mayfly, *ephemera albipennis*, first mentioned by Aristotle, lives about two years under water then, some fine evening in August, leaving the water and bursting its pupa case, abandons its chewing apparatus which it no longer needs and gills which are replaced by stigmata,[a] flies about then settles again to cast another envelop. The following seems to refer to the apparition of the ephemera, or some congener, on Rainy River, between Fort Francis and the beautiful Lake of the Woods, in British North America, during the month of August. As the sun went down, narrates the officer of the expeditionary force, a dense mass of curious looking flies came streaming up with the gentle westerly wind. They were nearly white, with grey wings and pale yellow bodies, having a tail more than an inch long consisting of what looked like two white hairs. They flew in regular column with all the appearance, at a little distance, of a driving fall of snow. Vast numbers struck the water from which they had not the power to rise again.[b] The ephemeras new career extends to about an hour after which, having deposited a multitude of eggs, this miracle of God perishes in all its delicate beauty falling in such multitudes near Lough Neagh in Ireland, where it is actually gathered for purposes of manure,[c] as to cover the spectator and whiten the earth like snow. To it might well be applied the fine lines of Malherbe—

> It was of this world where the sweetest things
>   Oft succumb to the evilest power,
> And, a rose, it endured as the roses endure
>   But the space of one single hour.[d]

What tongue of man, indeed, shall fitly set forth the wonders of creation, or the habits and conformation, and condition of creatures

[a] Wood, Common Objects of the Country.
[b] Blackwood's Magazine, February 1871, p. 165.
[c] Haughton, Three Kingdoms of Nature, p. 311.
[d] Elle étoit de ce monde où les plus belles choses
      Ont le pire destin,
    Et, rose, elle a vécu ceque vivent les roses,
      L'espace d' un matin.
                                                Stances.

whose mode of existence is so different from ours and, yet, whose life and action so often infringe upon and even closely affect our own.

The study of living organisms has now long ceased to be directed to the exterior envelop merely, but extends to the interior mechanism and various structures as well.[a] Every organ is with exactest nicety fitted to the performance of its predetermined uses and purposes, and demands therefore our reasoned appreciation and unstinted reverence. The parts indeed of each several animal structure are not only in exquisite adjustment to each other, but also to those of the various other members of the animated kingdom and outer world, the great city of man's life and action as well. For example, we can thrust aside molestation by the multiple action of our limbs, but in the brute this end is accomplished by the operation of certain muscular elements in connexion with the *cutis vera*, in human beings almost entirely absent.[b] Every creature, were it the very humblest, has an organization of the nature and operations of which, as for the most part is the case with ourselves, it is entirely ignorant, fitting it exactly for its position in the various relations of time and space. In the animated kingdom life, that wonder of wonders, is doubtless the great object of our reasonable investigation.[c] And yet, it is furthermore a declaration of divine power and skill, as well as of grace and goodness and purity. Gods fatherly providence and care indeed become only the more conspicuous the more closely we survey his works.[d] The wonders of creation are in truth illimit-able, not so, however, our means of investigating them.[e] Galen, in his book on the uses of the parts, speaking of the hand with its thumb or ἀντίχειρ in fact a second or opposable hand, glorifies the Creator in fitting terms of praise and thanksgiving.

> For it is as though one before some altar stood,
> Hymning, praising, the Author of all good.[f]

[a] So sehen wir z. b. dass der Bau der Verdaungs werkzeuge im genauesten . Verhaltniss mit der Beschabbenheit der Nahrungsmittel steht.   Tiedemann, Physiologie, s. 41.

[b] Wie wiet musculose Elemente in der Lederhaut der Wirbelthiere verbreitet sind, ist noch geau gekannt. Leydig, Lehrbuch der Histologie, s. 82.

[c] Der Gegenstand unserer Untersuchungen ist das physische Leben-was ist Leben. 9 R. Treviranus, Biologie, b. i, s. 16.

[d] Harvéy, Seaside Book, p. 20.

[e] Gosse, Romance of Natural History, Vol. i., p. 136.

[f] Ὄν ἱστάμενοι πρὸ τῶν βωμῶν ἦδον ὥς φασιν, ὑμνουτες τοὺς Θεους. ΠΕΡΙ' ΧΡΕΙΟΝ ΤΩΝ ΜΟΡΙΟΝ. Galeni Op. Lips. 1822.

What indeed, the human form and countenance excepted, displays more wondrous wisdom and contrivance than the hand. Linnæus begins and ends his treatises with bursts of praise to the Father of Life. Swammerdam most pious of men imagined that he had offended the Deity by revealing the secrets of structure. His description of the female, like that of Leeuwenhœck of the less frequent·male *pediculus capitis* aided only by a simple lens, is one of the most wondrous that was ever penned.[a] Naturalists, in truth, are rarely melancholy, and if Savigny became so, it was because, a martyr to science, he suffered from a morbid affection of the special nerves of sensation.

The creatures termed infusoria do not merely abound in infusions since they are discoverable in the fresh waters as in the deep sea. Retzius mentions that so many as nineteen species of these creatures abound in *Bergmehl* which, mixed with farinaceous matters, was used as food during the famine year of 1832 in Scandinavia. Living beds of diotomaceae, whole feet nay yards in thickness, are said to have been discovered beneath the surface at Richmond in Virginia, at Berlin, Bilin in Bohemia, the Isle of France, and elsewhere. The red tripoli used in house-painting, common tripoli as Ehrenberg has shown, snow salt and blood abound also in similar structures. The difficulty in fact seems to be to find where they are not, rather than where they are. In such minute organisms the structure is not always so simple as might be imagined. In reality, their tissues are often most complex and their organs as elaborate as in beings far more important. Some of the polyzoa, notedly the *escharidæ*, have cell appendages like birds beaks and like beaks too that shut and open. The lowest mollusca, indeed, are scarcely more organized than zoophytes yet the highest, as Harvey tells us, border closely on the most perfect animals. The great fields of nature, in verity, are fields of enchantment. The chlorops gobbles up the grain, but alysia perforates the chlorops eggs, while caterpillars in their turn are devoured by the ichneumons larvæ. Some insects emit delicious odours, others odours the very reverse of delicious. The sphex tribe and certain spiders seem to stupify their prey. The *mygale avicularia*, described by Sybille de Meran, as also the *aranea pullaria*, destroys birds. The hairy spiders which I encountered in

---

[a] Bijbel der Natuur Sesde Verfolg der Brieven, Delft 1697. Cited by Van der Hœven.

Africa were certainly big enough to compass such a feat. In North America I knew spiders to attack and destroy cockroaches. Then, there is the *mygale cœmentaria*, and others, which it would need a volume to describe. In Mariposa Calaveras and other districts of California, the redwood cedar and sugar pine are found in winter stuck all over with acorns, brought from a distance. These, softened by the rains, becomes the nidus of larvæ that constitute quite a grateful sustenance to the provident woodpecker at a season when other suitable food might prove difficult to obtain. We term the creatures who act thus provident, whereas it is the ruling of a higher power which they thus unwittingly and unreflectingly carry out. Some pursue a career which, were it unchecked by the hand that gave them birth, would prove ruinous to man, while again others are his friends. Among these are the carabidæ, beaming with purple and gold. Geer, the Reaumur of Sweden, tells us of the *reduvius personatus* which, like the lily crioceris, if that be the creatures name, disguises itself with soil. Some of the curculiones gleam like precious gems. The *proteus microzoon*, with its many stomachs, haunts the deep sea. The *medusa campanularia*, *physophora muzonema*, and *noctiluca miliaris* spread over wild wastes of ocean, shed a glow that vies with the stars. The *ateuchus sacer* beetle has been associated with the hopes and fears of millions, and still pursues its tireless task when those millions are no more. Yes, a little familiarity were it with the creatures of this divinest universe, cheers the heart, incites the soul to converse with its ineffable Author. At the very onset of his magnificent work on biology, Treviranus dilates on the multitudinous charms and graces which adorn our earthly state, how they elevate our spirit and foster conceptions of simplicity and beauty.[a] When Peter of Russia turned aside to visit Leuwenhœck at Delft, where the great naturalist entertained the royal savage with a sight of the circulation of the blood in the eels tail.

Linnæus, by the simple expedient of a binary system of nomenclature, one term bearing reference to the genus the other to the species, rendered the designation of created objects an easy task, and brought the recollection of their differential characters and endowments within the possible range of human faculties. Cuvier's services to natural science are great indeed, but perhaps his greatest service is as the principal founder of comparative anatomy. His

[a] Einheit Schönheit und Erhabenheit, Biologie oder Philosophie der lebenden Natur. Gottingen 1802.

Animal Kingdom will be a monument to his glory for ever. Had Aristotle alone described the lantern, as we term the wonderful aggregate of the teeth of the echinus now lying before me, he would have deserved well of science. Trembley, experimenting in 1700 on the fresh-water polyps, got in the pools nigh Paris, succeeded, with a little precaution, in dividing individuals some fifty times thus multiplying life and volition, so to speak, at discretion, a fact stupendous in itself and to our intelligence incomprehensible utterly. His very words are these:—In this manner, says he, I divided the polypus, in question, into fifty portions, all of which became perfect polypi.[a] More recently, indeed, Saars, of Bergen, cut up the *lucernaria quadricornis* or *auricula*, a sort of sea polyps, each subdivision assuming and preserving a new individuality indefinitely.[b] The mystery is one which has never been fathomed and which, the more it is studied, becomes the greater.[c] There is, there must be, a spiritual over-direction else such things could not be. In some respects, however, Needham went yet farther than Trembley, suspended animation in paste eels during the long period of seven-and-twenty years and then, magician as he was, restored them to life and movement by the addition of a few drops of water. Franklin indeed, followed by a recent observer,[d] tells us, if it be true, how flies long drowned in wine revive by simple exposure to the sun. Life, however, is not beneath the sway of mere brute forces. There is a higher and a different principle at work which, however it may turn such forces to account, is not at one with but above and beyond them all.

Every few years the records of natural science need to be collected, capitalized and recorded. The task, however, is too much for one. Even while he strives, science strides on and his work must needs fall short. Every now and then a complete outline of the natural sciences, drawn up without distinction of nationality by the most competent, ought to be freely distributed or sold at some low price for the solace and instruction of all. Meanwhile, we cannot be too thankful for such productions as the Philosophy of Zoology by Geoffroy Saint Hilaire, or the general

[a] De cette maniere j'ai coupé le polype dont il s'agit, en cinquante parties. Toutes ces cinquantièmes parties sont devenues de polypes parfaits. Memoires pour servir a l'Histoire d'un Genre de Polypes d'Eau Douce. A. Leide 1744, p. 237.
[b] Fauna Litteralis Norvegiæ, p. 21.
[c] Beale, The Mystery of Life, passim.
[d] Science Gossip, London, Hardwicke, 1870.

History of the Organic Kingdom by Isidore his son.   Reumurs
History of Insects, not to mention the writings of Latreille and
others, is simply admirable.   Louvain and Küchenmeister have
thrown unexpected light on the constitution of taenia.   Van
Beneden has established that the cysticercus and cœnurus are
embryo tape, and, further, that the so-styled worm was in reality
not so much one as an aggregate of many individuals.   Valen-
ciennes in his *Natural History of Fishes*, Blanchard in his *Study of
the Gasteropedous Molluscs*, Loven and Milne Edwards in their
Account of the Gastro-vascular System in the same class of Creatures,
by Quatrefages and others termed phlebenterate, have shed the
greatest light on various contested points of natural science.   The
varieties of structure and function, in some creatures, are unex-
pected as they are singular.   In the onodonta, a fresh water muscle
found nigh Paris, the heart is actually traversed by the last portion
of the intestinal canal.   Starfish there are which possess eyes at the
extremities of their rays, while in the amphicora Ehrenberg detected
like organs at the end of the tail.   Nemertes and planarias subsist
which can boast of fifty or sixty eyes on the upper and lower
surfaces of their heads.   The polyophthalmia, little yellow worms
that burrow in the sand, possess it seems three eyes in the head,
each provided with three distinct lenses, exclusive of a row of
smaller eyes extending along the body.   The habitat of some
creatures is singular in the extreme.   There are dwellers in mud
and slime, others in wood and stone.   A shrimp affects the brine
at Lymington.   Water almost boiling, even, is not without its
occupants.   Perfect multitudes live for a portion if not the whole
of their career at the expense of others.   There are beings, as the
œthelium septicum, found in tanpits and described by De Bary, at
one time fixed at another free and locomotive, so that it is
difficult to declare whether they should be esteemed plant or
animal.[a]   Saars portraiture of the spider-shaped *arachnactis albida*,
found swimming on or nigh the sea surface, hard by the island
of Flöroe, is truly pretty.[b]   The *salpa runcinata* of Chamisso, was
all unknown in the north until discovered in perfect multitudes by
Saars,[c] not far from Bergen.   The diversity of investiture, horn

---

[a] Cited by Huxley. Physical Science of Life.

[b] Die einzige Art dieses merkwur digen neuen Geschlechtes kommt im Spätjahre
und Winter an der Insel Flöröe, frei in der See schwimmend oder mit dem Strome
treibend, fast wie eine Spinne aus. Fauna Littoralis Norvegiae, S. iv., 3 Td., S. 63.

[c] Grant, Outlines of Comparative Anatomy, p. 139, 5 id.

cartilage or membrane, is very great. Annelids, generally, present a muscular tunic, resolvable into layers, beneath their outer covering. Owing to the opacity of their covering, the circulatory apparatus in the highly ærated bodies of insects was long thought to be a mere glandular sac closed at both ends. By the microscopic examination, however, of minute transparent larvæ and of the soft parts of perfect insects, just issuing from their larval coverings, it was seen that a fluid, abounding in globules, circulated in the winged articulata along the middle of the back returning by the sides. As a general rule, observes Quatrefages, the invertebrates have neither lymphatic nor chyliferous vessels, the various organs being separated by spaces or lacunæ filled with a sort of nutritive fluid which, seems to replace both lymph and chyle, and in which the organs are plunged. Phlebenterate molluscs, in truth, have no distinct veins. Otherwise the digestive canal with its contents occupies, with regard to all classes of living beings, much the same position that soil and air do for plants.[a] The branchellion, a parasite of the torpedo, shields itself we know not how, from shocks that affect every other creature.[b] The *termes bellicosus* has found its way into Rochefort where its career, as elsewhere, might certainly be arrested by the employment of petroleum spirit or the bisulphide of carbon. In Africa I was once present at the pulling down of one of the huge domical houses of these bellicose insects, only kept at bay by repeated buckets of water. At the very base of the burrow the pregnant queen was found huge of size in ceaseless vermicular motion, in truth a striking spectacle. In Africa the arena of inquiry is wide, but the labourers are few. Snakes, lizards, toads, frogs, tortoises, insects there are in infinite diversity. One day my Negro attendant shot one of those creatures intermediate, seemingly between lizard and serpent, some *chalcis* possibly or member of the genus chirotes. It was about six feet long and, as well as I can remember, possessed of two anterior podal extremities. The *lacerta viridis*, so prone to drop its tail, abounded in numbers numberless. I awoke one morning to find a lizard gazing intently at me with its brilliant eyes as it stood upon my breast. Frogs of remarkable aspect, peculiar toads, salamanders, chameleons, salute one on every hand. Gigantic earthworms issue from the turned up soil.

---

[a] Der Darmcanal ist für die Thiere was Boden und Luft für die Pflanzen sind. Van der Hœven, Naturgeschichte, S. 6.

[b] Quatrefages, Rambles of a Naturalist, English tr.

Every species of feculance was immediately occupied by swarming
larvæ.   The termites and their congeners devoured everything that
could be devoured.   I saw them, not without admiration, conveying
dead organisms far larger than themselves, with incredible pains
and cleverness to their lairs under ground.   If you permitted them
they could bite pretty severely.   A red ant, by natives termed
a bugabug, which I detected on the orange tree, would actually
bury its head in the back of the hand.   I kept an iguana, the
iguana tuberculata, with other creatures, monkeys, birds, a crane of
singular beauty, some time as a pet.   It had disappeared for a time,
until one day I discovered it suspended by a string from the eaves.
Natives smoke dry the iguana for food in their wicker huts.   The
periplaneta or *blatta orientalis*, most ubiquitous of insects, often
flew in ones face at nightfall, or even nibbled at the feet while one
slept.   Grasshoppers crickets locusts, the various batrachians,
drummed piped droned and chirped, more or less at all hours, but
more especially at night.   Land and water serpents would combat
with each other bitterly.   Alligators gobbled up great fishes whose
tails slowly walloped as they disappeared.   The tales recounted of
their voracity had no end.   Birds, perchance some red-hued creature
like the copper-dyed *turaco* of the Cape, would flash past you like
a tinted cloud.   I have seen kingfishers by the brook sweeping
from bank to tree the living counterpart of some sparkling gem.
Butterflies there were, ablaze with colour, white lilies of celestial
purity and perfume, coronetted blossoms, wild fruits, russet and gold,
like apples of the Hesperides.   Arachnids of formidable dimensions
being less dangerous however than the high water mark haunting
ratipo of New Zealand which Dr. Parnell tells us about, hovered
over ones couch.   Many-footed centipedes, scorpions, with other
strange creatures, peopled the dry leaves and did not even disdain
to nestle beneath your couch.   Antelopes, leopards sometimes,
flitted amid the green glades, while serpents and other bright-hued
reptiles went their errands in the long grass or, perchance, give you
a rendevous amid the wild bananas, the pine apples, the pawpaw,
the yellow plumtree, or the sago palm.   Lovely shells and glancing
fish, some stray hippocampus or washed-up pericarp, would challenge
notice on the glistening strand.   Glancing along the brackish waters,
one might discern some floating sawfish, the cutwater of a shark,
some snorting alligator on the prowl for prey, or perchance at
sunset a swift canoe, impelled by Negro girls whose laughing voices
sweetly chimed to the cadence of their oars.

Finer looking men and women than one beheld in this sultry land, Hebes and Antinous in bronze, surely never were. Their grace of motion oftentimes, was positively charming.[a] It was a sight to look at the Crewmen wrestling on the silver sand, or the young women pounding rice, snaring crayfish or prawns, or setting little conical leaftraps for the jumping fish, quite as good to eat as white bait, no other I think than the *anableps artedi* or *Hochgucker*, from its prominent eyes, described by Van der Hœven, also discovered at Surinam. In the early morn clouds of screaming parrots flew joyously high over head to their feeding grounds amid the oil palms, and returned with like demonstrations at eve. The ever-courteous natives too would bring you roasted ground nuts, yam cassada or golden green oranges, smoked turtle eggs, eggs found by prodding in the sand, or the turtle themselves, fresh oysters pulled in whole clusters from mangrove tree, gigantic land-snails or, possibly, a green bladeful of the immense white larva of the *calandra palmarum* obtained by cleaving the stem of the fallen tree. It was pleasant to stroll amid the wild pines plenteous as thistles are here, in the market where more tongues were spoken than in any Babel, or to visit the native huts with their teeming inhabitants, amid such sunrisings and sunsettings to look at some soft-hearted Negro mother as she anointed her satiny baby with the concrete oil of the palmnut kernel, till the black darling shone again. It was pleasant one evening boating on the river to gaze now on the margin of sand, white as driven snow and the skirting forest except where at intervals the muddy alluvion yielded foothold to oyster-laden mangroves, tenanted with pensile nests, serpents monkeys and various other living things. In the upper reaches huge alligators displayed their rugged backs above the stream. It was hot, too, and the skin reddened when one held ones hand beyond the awning. At Tasso Isle, the soil was absolutely golden with fallen limes. Clearing the broad flood beyond one could discern the old wife, and other fish, flitting amid the clear depths below. As the rapid twilight fell, I found I could read by the flash of the silver ripple and, ere I reached Freetown the stars were all aglow. By night it was different. How solemn did the dark woods appear and the rushing waters no longer illumined by the sun. Portentous noises broke the silence, meanwhile the swart rowers toiled stoutly against the current, cheering themselves with their soft-voiced

[a] Bowditch, Mission to Ashantee.

songs. When it rained they would divest themselves of their
scanty coverings, sitting on them till it faired. Where it grew
shoal, leaping into the current they would urge their craft into the
deeper channel. Ah, the hours were dark and weary and chill, for
I was fever-stricken and ailing, though my good brother had
wrapped me up as warmly as he could. And it was a real relief,
as grey dawn appeared, when one could discern the long-shanked
cranes as they plied their vocation amid the shallows and the, in
spite of Darwin, unprogressive monkeys as they played leapfrog
upon the strand.

On first arriving at some strange continent, what then must have
proved the feelings of Columbus and his crew, one feels overcome
by the novelty, the unwonted sights and sounds and odours that
simultaneously assail the sense. Everything at first is of interest.
Many times, during the first night watches off African or American
shores, have I got up to gaze at the green wooded heights of the
one, the burnt up tawny hues mingled with the profuse vegetation
of the other. The great volume of Creation and of God, lay open
before one to read at will. There, are as if the characters and
utterances of some as yet all unknown tongue. In every portion
indeed, of the American Continent, objects of deepest interest await
the attention of the investigator, and in truth constrain it whether
he will or no. The spirits of air were all on the alert to welcome
me to the New World, and a heavy gale off Sable Island, to which
the ship approached undesirably near, made one regard with a
strange sense of satisfaction in the sailing directions, that places of
refuge, with fuel and provisions, awaited those shipwrecked persons
who might be so fortunate as to reach the shore. But our perils
escaped from, we found air earth and water everywhere replete with
attractions. The great silent forests, with trees of solemn aspect,
differ from those of Europe so full of life and choral harmony.
The long cold winters are too much for the little birds, though,
when the season comes round, the woods echo the strokes of the
woodpeckers bill, with here and there the capri mulgus or goatsucker
of melancholy wail, in clearings the cow bell and ceaseless jubilee
of the grasshopper *acrydium migratorium*, catydids, and swarming
batrachians, the shrill yet pleasing *hyla* or tree toad perhaps in
especial. When one gets as far south as Maryland, however, one
hears with delight the mockingbirds long drawn whistle, and in
great seabays the heavenly carol of the sousoutherly, sweetest note
of any bird that skims the deep. Reedbirds twitter everywhere,

blue birds and red flash through the sunlit foliage, humming birds
with their unspeakably lovely radiance and versatility of hue flit
from flower to flower while, at eve, the lightningbug or firefly
describes its ceaseless curves of magic brightness in the air.
Serpents are less common than expected, but I saw and indeed
captured the watersnake nigh Philadelphia. The rattlesnake with
its lidless eyes of diamond brightness and unblenching gaze, was
among the most impressive objects of the kind I ever beheld.
Oysters, delicious clams and the *homarus Americanus*, homologue of
our lobsters, subsisted in vast abundance. Shad, rock cod, and
other cold water fish, owing to the providential arrangement, which
Maury describes, abound plenteously. Halibut and cod subsist in
like profusion. One of the latter, which I caught on the Great
Banks having dropped off the hook, I saw with amazement that it
everted its stomach, as Couch says fish sometimes do,[a] struggling
for many seconds ere it was able to get below. Never did I see
so many toads as in America. They swarmed, for example, by the
roadside at Bunkers Hill. And one day by Lake Erie, I was
witness to the curious spectacle of a multitude of little toads not
larger than beans which, impelled by I know not what instinct,
leaped into the mimic surge to be cast back next instant by the
incoming ripple, only to renew their leaps as long as I cared to gaze.
Man himself, the most interesting of objects to the naturalist, at
least European man, has not thriven so well in the Americas as
I think he ought to do. He has become lankey, hollow-chested
and sallow, while his teeth have sadly failed. This might doubtless
be largely remedied by wholesomer modes of living, simpler diet for
the young, slower eating, more open air life and action, less tobacco
and less rum, with the freest admission of open air, at all times and
seasons, into the sleeping chambers by night. And, yet, have I
seen magnificent Anglo-Americans, and in woman every species
of winning grace and loveliness, *incessu patuit Dea*. At the
Great Lakes indeed, speaking of the Indians, I saw in hundreds,
men and women, with teeth like pearls, a gait like the bounding
roe. Americans ought to foster this precious race, elevate them to
the uttermost, and incorporate them with themselves. The treat-
ment of humanity in the United States forms, in too many respects
a painful chapter in the history of our kind.

Fresh discoveries in natural science accrue year by year, and
day by day. Gigantic saurian remains have recently been found
to abound at the Antipodes, as well as in older lands.[a] Depths of

[a] Lyttleton Times, June 1869.

ocean once supposed to be barren of life and inaccessible to human research, are now shown by Ross Thompson Carpenter Gosse and others, to abound with echini starfish crinoids, many of them of exquisite structure, forms previously entirely unknown.   Some of the so-termed glass sponges vie, I think, with any objects of nature or art that ever were seen.   At depths of 1,400 fathoms Mr. Jeffreys obtained living mollusca, stalk-eyed crustaceans, and blue echinoderms of the holothuria family.   Many of the crustaceans were scarlet or red with feathered tails and processes of scarlet hue. Among other striking novelties was a holothuria five inches long by two and a half in circumference.[a]   The infusorial rotifera discovered by Ehrenberg, have left bulkier residues than the mighty mastodon or gigantic dinotherium.   The *cyrtidosphæra echinoïdes*, a creature of marvellous structure singly invisible to the naked eye, twenty years since unknown quite, and only investigated within twelve, has supplied as Hæckel tells us,[b] materials for entire hills in the Nicobar Islands of the East Indies and Barbadoes of the West. Ross, speaking of the Victoria Barrier, 400 miles long by 120 wide, informs us that it is composed almost entirely of infusoria.   Tripoli powder indeed is no other than the silicious coats of perished diatoms.   Nummulitic limestone, in some places thousands of feet thick, extends all the way from China to France.   The pyramids are formed from it and, of course, the mountains whence the nummulitic limestone comes.   Paris is mainly constructed of foranimifera, the milliola especially, with nummulites as big as a shilling.[c] The chalk of Meudon, not to mention other places, Touchet states, abounds in animalcula.[d]   Position and structure in truth are enchantingly diversified, and functions often as various as is the form. Certain creatures, as Chamisso has shown, are alternately viviparous and oviparous.   Robin and Natalis Guillot describe rays in which the bloodvessels break off suddenly, as in the lowest organisms, the contents escaping freely into open cavities.   The *groomia milliola*, if not the common slug, climbs a glass vessel by means of extemporized feet which disappear into the creatures substance when the act has been accomplished.   The slugs progress, as seen through a pane of glass, is infinitely curious.   The tree toad of New Grenada, Escobar informs us, yields a poison whose toxic

[a] Nature, 2 Dec. 1869.

[b] Ganze Berge.   Op. citat.

[c] Nicholson, Advanced Text Book, p. 32.

[d] The Universe, p. 90.

action implicates the organs of locomotion.[a]   In the sponge a semi-fluid substance or sarcode is superimposed on a multilocular network, in different species variously constituted, while in the amoeba there is but the semifluid sarcode itself, without apparent structure or organization, and yet none the less instinct with vitality and coalescing seemingly with other masses like water drops or silver quick.   Dr. Henry Burden in the course of his researches, has had occasion to study the habits of the *sepiola rondeleti* cuttlefish which he found wandering in pools at Orlock Point, in county Down, and which he preserved in glass vessels alive for days.   The singular alternation of colours which it displays, he with others has shown to prove coincident with alternate expansion and contraction of the chromatophores which, as he has demonstrated, continued for hours even after the portion under observation had been removed.[b]

Before 1856, batrachians were supposed to be the only vertebrates that underwent metamorphosis, until it was shown by August Müller, in his paper on the development of the nineeyes as he terms it, that the presumed fish, ammocetus, was in fact no other than the larva of the lamprey.[c]   Quatrefages, commenting on the circumstance, indeed asks whether the amphioxus itself may not after all turn out to be the larva of the *petromyzon marinus* or possibly some other allied species.[d]   Marvels in truth await us at every turn and, whether we will or not, challenge our admiration and attention. The bather in temperate regions, in tropical ones it is sometimes worse, hurrying into the deep, perchance finds his foot stayed or even wounded by the jagged points of the acorn barnacle growing on the wave-washed rock.   The balaenidae, in truth, are not a little interesting endowed as at one time they are with sense organs and locomotive powers, at another stationary with ciliated cirrhi instead of feet and successive carapace and bivalve shells like those acephalous molluscs, oysters scallops muscles and the rest.   Very singular are the transformations of the little green crab which swims the sea as a zoe, long imagined to be a distinct creature, just as were the phyllosomidæ or lobster larva themselves.   In creatures which undergo metamorphosis, the changes are commonly gradual and progressive.   The young caterpillar, although in preparation

[a] Annals and Magazine of Natural History 1869, p. 135.
[b] Belfast Natural History Society, 2 Nov. 1870.
[c] Ueber die Entwickelung der Newnaugen.   Müller, Archiv, cited by Quatrefages,
[d] Metamorphoses, Lawson's tr., p. 123.

for all three, has neither wings antennæ nor proboscis. In molluscs, worms, crustaceans, and batrachians, alterations take place openly, whereas in insects, hemiptera orthoptera and others, they are hidden in the depths of the tissues until everything shall prove complete. Oviparous animals, birds and lizards, are first organized within the voluminous vitellus whereas viviparous, as a condition of their development, must perforce remain in the maternal uterus and there receive sustenance through transitory organs. When old structures are removed and new ones developed in tissue and organ, one is resolved as the other is built up and framed, atom by atom. In insects and crustaceans, indeed, the old insoluble investiture is laid aside and, yet, molecular deposit absorption and waste go on within the larva prior to its becoming a crysalis, certain nutritious fatty matters being stored up for the purpose but which in the perfect insect disappear. And thus do these creatures, according to preconceived arrangements derived from a higher power, natural laws as Mr. Mivart observes coupled with the concurrence of their Creator Upholder and Lord,[a] like all others undergo successive material changes and development.

In the vertebrates, at any rate, the exercise of perception and will need, in some sort, the intervention of a brain and medulla spinalis. And yet beings subsist in which faculties and a reasoning will appear as if diffused through every portion of the nervous system. The nature of the congress of the *ego* and the *non ego*, of what we term mind and matter, we do not know, and in this life shall never know. Not the less, however, the amazing, the stupendous fact is there that mind is to hand, mind working to fixed determinate ends, not originating in the creatures through any possible congress of material forces or atoms, but the incoming or influx of an over intelligence, mighty indeed and all sufficing, extrinsic to themselves. Remove, says Quatrefages, from a praying mantis the head and posterior portion of the body, and yet the prothorax, with but a single ganglion, will live and display defensive acts afterwards for more than an hour. But this singular and to us, at least, quite incomprehensible phenomenon, is not confined to the mantis only. When the head of the blowfly is removed, vitality and intelligence do not immediately cease. The creature is still capable of directed action and, when dust is showered upon it, will even endeavour to remove the incumbrance with its tarsi.[b]

[a] St. George Mivart, On the Genesis of Species.
[b] Lownes, Anatomy and Physiology of the Blowfly.

The manifestations of mind indeed, in whatever form they may present themselves, are alike wondrous and hard to understand. The parasites that implicate the frame of man and brute, the minute organisms described by Redfern,[a] the vibrios found in water, work or appear to work to given ends, preserve their species and secure their sustenance. Annelids, insects, there are which, in point of structural complication and completeness, vie even with man himself. They think or seem to think, in a limited way exercise volition, make use of subservient apparatus and, in fact, vary their conduct according to the exigencies of the moment. Thus, the bee will enclose the intrusive slug in a sort of a living tomb and, guided by experience, raise ramparts against the deaths head moth or sphinx.[b] Not one, however, but many analogous instances might be cited. Saars account of the doings of the aurelia medusa is interesting in the extreme. The common pecten, also the St. James or pilgrim shell mollusc, has very complete visual organs in the margin of its mantle, supplied not from an encephalon, for it has none, but from a ventral ganglion. A certain annelid on the Sicilian coast, has eyes as perfect nearly as those of a fish. Quatrefages in his delightful work, which reminds one so of Humboldts *Ansichten*, mentions having once enucleated from this annelid a lens which, suitably adjusted, converted his microscope into an effective telescope. The annelid itself, doubtless, found it not less serviceable. Those spiders which Bates encountered on the Upper Amazon seem to be perfect wonders of intelligence. Some creatures in the pursuit of prey, evince resources that would do no discredit to beings vastly higher in the scale of creation than themselves. Nostics seem little other than green globules with a mucilaginous investiture and, yet, their movements are towards determinate ends by appropriate means. The eunice which, in the Mediterranean reaches the length of a foot or two and in the East to six, with its lovely plumes, leads a lively enough existence in all our seas, is provided, with some five hundred branchiæ and six hundred hearts. Gasteropodous molluscs allied to tritons there are, one among vast tribes each endowed with a special life and action of its own, which possess crystal horns and rosehued branchiæ, in fact living gems. The stephanomia, a compound polyps, is an animated garland. The *velella spirans* and others, found along with the *physalia pelagica*, the *ianthina fragilis* and *echinus lividus*

[a] Report to the Directors of the London Spring Water Company.
[b] Bevan, On the Honey Bee, Van Voorst, 1870.

on our lovely Irish western coasts, glow with colour by day and light up, each a living fire, the tropic seas by night. It were hard to say what the actual doings are of the *nemertes*, those gigantic marine worms oftentimes fifty or even sixty feet in length, but doubtless they are appropriate to the ends of their existence. The *synapta*, when it runs short of supplies, has been seen somehow to lop off or truncate its own body, in successive portions, with the view it would seem to the better sustentation of the rest. Vertebrata, radiata, mollusca, and articulata lie buried in the dust or shrined in the fossil beds of the past but, if so, their living analogues not the less accompany us in life and like us encounter death.

In experimental physiology, Claude Bernard justly observes that as the inquirer, to a certain extent, governs circumstances, it becomes obligatory upon him to avoid the *post hoc ergo propter hoc* line of reasoning. A similar obligation, however, applies in all cases. This premised, I proceed to observe that inferior organisms, or what we so term, often serve to elucidate structural and functional problems where higher ones are found to fail. Thus the diaphonous amphioxus, hardly a vertebrate, in virtue of its translucent structure, is found not only to throw considerable light on various physiological processes, but on transitional animal structures yet more perfect, as well. The operations of the brain and spinal cord, or nerves of animal life, with those of the sympathetic or nerves of vegetative life, so named, we must study concretely in each several species. Our systems perhaps take too much account of merely proximate relations whereas the natural method, which after all is the divine method, regards every organism as placed in the centre of all others and holding relations to all.

The lumbricus and nais live in fresh water or moist earth, while the tubicolous groups and allied annelids dwell in salt. The teredo is an acephalous mollusc like the oyster or mussel and, although soft as butter, carves its way we know not well how amid the hard wood as, without revealing its secret, does the lamellibranchiate bivalve, the pholas, amid the living stone. The mammalia at one end of creation, zoophytes sponges the amœba monera and *bathybius hæckelii* at the other, yield exhaustless scope for a study which, rightly conducted, tends to refine the intelligence and ennoble the heart. The production and the reproduction of were it the humblest insect is a fact, in some respects, not less stupendous than is the comets flight or the projection of a sun. It is a fact somewhat inconvenient for the advocates of abiogenesis

that no new forms of life are found to be produced. There are indeed, as it is, enough. The various structural forms with their admirable mutual subservience, is enough to incite every soul to exalted utterances of wonder and praise. The thorough study of a single species, were it, is a better steppingstone to a knowledge of the wonders of zoology than, without it, would prove the vague superficial consideration of a hundred forms. There cannot, indeed, be too many monographs, good ones though, such monographs for example, if so they can all be termed, as Dujardin on the Rhizopods, Garrells British Fishes and Birds, Rathke on the Embryology of the Crayfish, Forbes' Starfishes, Valentin on the Echimus, Forbes' and Hanleys British Mollusca, Newport on the Myriopods, Grube on the Annelids, the Ray Societys Nudibranchiate Mollusca, Bojanus on European Tortoise, Cloquet on the Ascaris Lumbricoides Da Costa on the Amphioxus, Krohn on the Salpæ, Dujardin on the Medusa, Hæckel on the Monera, and very many besides. Strauss Durckheim on the Cockchafer is admirable. He it was who instructed us how to throw in minute injections, and persisted in his labours till blindness arrested his career. Papier carton models of the cockchafer, on a very large scale, were on sale a few years ago. It is much to be wished that models could be made of other creatures as well.

Immutable predetermined conditions, indeed instituted by a loftier rule than ours, regulate every operation of life. These conditions are inexplicable by any law of matter or force.[a] In fact, they overrule and control the several laws of force and matter. Matter and force, the *Kraft und Stoff* of German materialists are, in themselves, lifeless and irrational, incapable utterly of generating life and reason, or of regulating those operations of life and intelligence to explain which some, *à mon avis* insanely, call them in. In the present state of knowledge it is simply astounding, observes Beale, that reasonable people should accept the dogma that life is a correlate of heat.[b] Life, he truly adds, is separated from non-life by a barrier that is impassible. Matter, its properties and forces, belong to one category or order, created power will mind design life, to another and very different order indeed. In mammals the production of new individuals is preceded by the direct congress of sperm and germ. Bonnet however pointed out that in the plant bugs or aphiudes gemmation or fission, to a certain

a Metamorphoses of Man. Lawsons tr. preface.
b Mystery of Life, p. 62, 3 id. p. 64.

.

limited extent, sufficed. Chamisso showed that something similar ensued in certain molluscs, for example the salpæ, as Saars did in regard of the sea polyps. While, again, Kuchenmeister and Van Beneden demonstrated that the tænia gives birth to a series of offspring not immediately, at any rate, the counterpart of itself. Nothing however is more certain than that in order to insure the permanence of species the two factors or elements, already named, are essential absolutely. A multitude of creatures undergo a series of metamorphoses while others, or it may be the same, give rise to offspring, in the first instance at least very different from themselves, by a process to which M. Quatrefages applies the term geneagenesis.[a] Tapeworm joints, for example, constitute the ripe proglottides or strobila, containing the fecundated ova which, after exclusion from the bowel, are let loose by the dissolution of their vehicle, and are dissipated by wind and water, some to be swallowed by sheep swine and dogs, and others as in Iceland to be inhaled, as I believe by man himself. Thus, the proscolax being liberated, boxes its way into the tissues, becoming a scolax, as we find in the so-termed measles of the pig. I have found the psoas muscles and tongue of that animal, when thus implicated, indeed quite full of tapeworm germs. Various tapeworms, in truth, subsist in different animals, as the *tænia mediocanellata* from the measles of the ox, the *tænia crassicollis* of the cat is but the developed cystic worm of the mouse, the *tænia pisiformis* of the fox is derived from hares and rabbits, while that of the dog is no other than the developed *cœnuris cerebralis* to whose presence is ascribable the staggers, so named, of the sheep.[b]

Marvels greater than those related of any magician, subsist unnoticed at our very doors. Some few summers since, passing through a kitchen garden, the cabbage moth, *pieris brassicæ* or *chariclea rapæ*, of which Reaumur and Herold have yielded so wonderful an account, disturbed by my approach, flew up in numbers numberless. Each indeed was a winged caterpillar, one of a numerous family, in structure analogous to if not identical with the caterpillar of the goat moth or *cossus ligniperda*, with its 1647 muscles, 218 it is alleged in the head, 2186 in the digestive organs, 4061 in all, while man enjoys but 529, a caterpillar to the elucidation of which Lyons, the Maestricht advocate, devoted a quarto volume and numerous illustrations, along with the study of

[a] Metamorphoses of Man, Lawson's tr. passim.
[b] Nicholson, Manual of Zoology.

a life.   Well might Cuvier commend the book, imperfect as viewed in the light of modern science, it undoubtedly is.   Astonishment in fact is hardly a word for the emotions which its perusal is calculated to excite.   But as to the pieris, when September comes round, it lays some hundred or so of minute eggs which it firmly glues to the cabbage leaf.   The caterpillar being hatched it eats with avidity and moults, or casts off its skin, a number of times in succession until it reaches its adult size.   The mouth is framed with horny mandibles and jaws to match, to enable it to brouse.   It has spinnerets, withal, in order to weave its silken couch.   It has also horny or true, and potential or pseudo feet.   About October it undergoes its first metamorphosis, its body shortens, grows discoloured, and becomes endued with a sort of varnish.   In Spring, the pieris emerges from its chrysalis envelop, a black and yellow moth or butterfly, with two simple and a mass of trellised eyes some thirty thousand in all, a perfect miracle of structure in limb and frame to pasture on the nighest flower.   The cabbage moth however, would prove even more destructive than it is, were it not for the ichneumon fly, the *microgaster glomeratus* which uses the caterpillar as a deposit for its young, according to Reaumur destroying nine-tenths, while Blanchard found that only three out of two hundred reached maturity, the microsaster having exterminated the rest.

The typical insect, observes Quatrefages in his Metamorphoses, might be defined as an annulose animal, breathing through tracheæ, with a body in segments, head thorax and abdomen, of which the middle displays three pairs of legs and a couple pairs of wings, and which arrives at its perfection after two metamorphoses. Sometimes, for instance, the lepidoptera are constructed on this ideal plan.   The important subjects of the nervous system and respiration of insects have been handled by Newport whose Essay on the privet moth, *sphinx ligustri*, as well as that on the nettle butterfly, elicits from Quatrefages the warmest praise.   Independently of their egg life, the career of insects may be said to embrace three stages, the object of the first being growth, of the second the modification of the individual and of the third the continuance of the species.   Thus, from the egg of the wood-eating cossus, *cossus ligniperda*, is bred a caterpillar which lives two years and is converted into a chrysalis.   This in turn becomes a moth without a proboscis, which eats nothing, and indeed only lives to perpetuate its kind.   Speaking of the coleoptera, the subterranean life of that

destructive creature, the cockchafer, or rather its larvæ, extends to
three years. It may be truly said to assail vegetable growths,
according to its state, both root and branch. But such is the
unspeakable diversity of nature that no amount of study or
investigation, to whatever subject it may be directed, suffices to
exhaust it entirely. There is this distinction between vertebrate
animals and the articulata, that in insects there is virtually a
metamorphosis. In the *periplaneta orientalis* or common cockroach
there subsists, as Mr. Lowne tells us, but the ordinary development,
whereas in the butterfly the alteration is complete. In the blow-
fly, indeed, a creature whose organization and doings are to the full
as surprising as those of any creature extant, not a single structure
remains as it subsisted in the maggot.[a] No more remarkable
contribution to natural history and illustration of the divine power
was, I think, ever made than what we find in Mr. Lownes' great
book. The compound eyes of the blow-fly he, Mr. Lownes, tells
us consist of a compound cornea beneath which are the nerve
filaments of the optic nerve, each some one two thousand and five
hundredth part of an inch in diameter. Exclusive of the great
eyes, however, there are three ocelli with their appendages and
corneas, each one four hundredth part of an inch in diameter.
Than the flys proboscis, however, there is perhaps no more wondrous
object within the entire circle of nature. Mr. Lownes' illustrations
of its proboscis, with those of other portions of the insects structure,
are deserving of unbounded praise. The lower organisms, with their
amazing and in truth stupendous structure, instinct as they are in
their several spheres of action with life and energy, like ourselves
occupy for a brief instant a portion of life and space and time and
then, like ourselves also, pass for ever away. We and they, one
and all, and one perhaps as much as all, are products of divinest
thought and power and skill, and not less, I am persuaded, the
object of providential care each several moment, nay the subjects
of creative separative effort, as much as on the first day.

Sooner or later, every creature according to its kind, *omne vivum
ex ovo*. The infusoria even, as demonstrated by Balbiani, like
mammals birds and molluscs, produce ova marked by three
concentric spheres which, short of the male element, are not
fertilized but, when that has acted, the germinal vesicle and spot
disappear prior to the conversion of the ovum into a new being.

---

[a] Lownes' Anatomy and Physiology of the Blow-fly.

No vertebrate animal is reproduced by geneagenesis, among the highly organized invertebrates it is rare and, even among insects of which there are supposed to be one hundred thousand species, it is not common. One instance occurs among the hymenoptera in the ophionurus namely one of the pteromalidæ which, like others of its sort, deposits ova in the eggs of a small coleopteron the *rhynchites betuleti* beetle which infests the vine. The development of the germ, in truth, is a most wondrous epigenesis, a succession of metamorphoses, in fact a sort of transitional comparative anatomy, as comparative anatomy itself, might be termed a permanent embryology. The ovum, then, is a minute body not larger in fact than a grain of fine sand found, after its escape from the Graafian follicle, subsequent to heat in animals and menstruation in human kind, through the Fallopian tube. Formed of the vitelline membrane and a semi-fluid matter termed the vitellus it is fecundated, when fecundated, by certain anatomical elements, as they are now shown to be, named spermatozoa.[a] MM. Bischoff and Raciborski were among the first to demonstrate the constitution of the unimpregnated ovum in the light shed upon it by the researches of Baer. Baer indeed, in 1827, had already compared the ovum to the germinal vesicle discovered by Purkinje in the yolk. Prevost and Dumas pointed out the cleavage and entire or partial segmentation of the vitellus in all or at least the greater number of animals,[b] Arachnids and insects, as Robin has shown, excepted. Lastly, Coste demonstrated the germinal vesicle itself in the ovule of Baer, thus proving that in all mammals, at least, each and every individual proceeds from a true ovum as in the birds.

Multiplication by eggs then alone is fundamental. The distinction, as between oviparous and viviparous, is in reality only apparent. Baer, in discovering the mammalian egg, and Coste, in showing that it possessed the same constitution as the egg of birds, have placed this matter beyond the reach of doubt. Not only mammals but man himself, as well as eggs and birds, proceed from the egg. The vitellus or yolk consists of a substance at once nutritious and organizable. In mammals, as in the radiata or worms, in man as in the hermella or synapta three spheres, the function of which is not exactly known, lie one within the other enclosed by a translucent membrane and constitute the

[a] Kölliker, Microscopic Anatomy, English tr. p. 447.
[b] Todd, Cyclopædia of Anatomy and Physiology, Vol. v., p. 46.

germ. In short within the vitelline membrane or *zona pellucida*, may invariably be detected the vitellus or yolk and the germinal vesicle of Purkinje. Thus, then, there are three folds or leaflets within the germinal area, from the upper one of which are developed the organs immediately connected with sensibility motion and volition, that is to say the brain spinal cord nerves bones and voluntary muscles, from the middle fold emerge the heart veins and arteries, while from the lowest come the organs of digestion with their appendages.[a] In the conversion of the embryo into the chick, the whole wondrous course of vitelline development may be witnessed. Anything more marvellous is not to be seen under the sun.[b]

Thus, then, there is no such thing as spontaneous or equivocal generation, no heterogenesis, no new species, nor any old ones either without the congress of sperm and germ. Physical forces, heat light and electricity, are no more competent, *per se*, to give rise to life than they are to give birth to thought. There is no plastic force apart from that imparted by vitality, the vital vortex, and this itself is divine. In other words, as M. de Quatrefages expresses it, the organization of an ovary or an ovule is, in a physiological point of view, a phenomenon of quite as high an order as the creation of the most perfect organism. The employment of the microscope permits us to trace the development of the germ, leading in fact to a new branch of science.[c] Certain sexless animals by gemmation produce creatures like themselves as well as others very different. Steenstrup, however, along with Van Beneden Küchenmeister Siebold Baer Graaf Purkinje and Coste, by his researches and his theory of alternate generation, was enabled to shed the greatest light on the whole process. The parasite shares the fortunes of the individual on which it engrafts itself. When the latter is devoured the parasitic helminth is transferred, also, and either dies or is digested as its new habitation proves suitable or unsuitable for its wants. When the egg of the distoma falls on a leaf and is swallowed by a mollusc, some lymnaea or paludina in whose interior it is hatched, it gives rise to a scolex or ciliated larva which, in turn, originates a strobule or sporocyst, whence issue a number of proglottides or cercariæ. The greater number perish, but a few find a nidus in some larva or

---

a Quatrefages, Metamorphoses, Lawson's tr. p. 10, 26.

b Hassall, Microscopic Anatomy, Plate x.

c Marey, Du Mouvement dans les Fonctions de la Vie, p. 7.

mollusc which, being devoured by frog or bird, therein experiences development. In fact Küchenmeister fed dogs with the cœnurus inducing the wolf tapeworm, and sheep, leading to cœnuri in various stages in the brain. Thus falls, so far as these experiments go, the dogma of spontaneous generation, and thus is the more firmly established Harveys famous dictum, all the phenomena of transformation metamorphosis and geneagenesis notwithstanding, that every living thing, first or last, cases of parthenogenesis inclusive, springs from the egg. Every animal indeed derives from an ovum, is invariably preceded by a mother. Whether a real and not merely an imperfect and transitory parthenogenesis can ensue remains to be determined. In fact, reproduction by buds, by division, and the different forms of alternate generation, are after all but varying manifestations of one great phenomenon. The same is doubtless true of parthenogenesis as of geneagenesis of which it is but a form. To the idea however of the continuity of individuals we must, as was understood by Steenstrup and Chamisso add that of a succession of cycles. But as to spontaneous generation there is none. Force indeed is blind and matter inert, while the origin and regulation of the phenomena of life must of very necessity be referred to a source extrinsic to themselves.

Art. IX.—*On some Points of Interest in the Medical History of the Himalayas.* By Wm. Curran, L.R.C.P., Edin.; M.R.C.S., Eng., &c.; Assistant Surgeon Army Staff.

"It is an unmistakable fact," says Karl Ritter, "that the character and situation of countries, as well as their natural features, operate upon the inhabitants of those countries, influence their development and the functions they have to fulfil,"[a] and the effects of this influence have not, as yet, I fear, been sufficiently estimated

[a] Quoted in Miss Bremer's Travels in the Holy Land, Vol. i., p. 312; see also the Testimony of the Rocks. By Hugh Miller, pp. 252-3-4. Mr. Darwin, who has more fully developed this point than perhaps any other living writer, bears emphatic testimony to the value of the same influence, and in one of the earliest of his publications truthfully says, "What a difference does climate make in the enjoyment of life! How opposite are the sensations when viewing black mountains half enveloped in clouds, and seeing another range through the light blue haze of a summer's day! The one, for a time, may be very sublime; the other is all gaiety and happy life."—Journal of Researches into the Natural History and Geology of the Countries visited during the voyage of H. M. ship "Beagle," pp. 213-216 and 253.

or understood. I purpose discussing one phase of the question in the following communication, from a point of view which has rarely if ever been brought so exhaustively under notice before, and may be able to follow up the inquiry at greater length hereafter. It has indeed a peculiar interest for the military sanitarian and statist, inasmuch as it bespeaks a wider knowledge of climate than is usually possessed by his civil brethren, and underlies the whole question of the acclimatization and settlement of Europeans in the tropics. There is no instance on record, as far as I can judge of the inhabitants, of a cold or temperate climate perpetuating its characteristics and isolation, for any long time together, under the rays of a tropical sun, or *vice versa*, and the example of the Crusaders on the one hand and of the Goths and Vandals on the other, furnish abundant proofs in point. On the other hand, the Franks, the Danes, and the Normans, who merely removed from one temperate country to another, have either increased or retained their original vitality, or have so coalesced with the inhabitants of the countries they conquered as to lose much of their own individuality, and become lost in the crowd or identified in all the relations of life, with their neighbours. This was especially the case in Ireland, where, in spite of the most urgent stipulations and orders to the contrary, the invaders of 1172 and their descendants assumed so much the ways and manners of their neighbours, as to become in time " more Irish than the Irish themselves," and however strong the likeness may have been in bygone days, it would be now impossible to discover any trace of his " four masters " in the face or fortune of the typical Englishman.

The tenacity with which the inhabitants of mountainous countries cling to their homes and associations is well known, and the people here referred to are no exception to the rule. On the contrary they supply the very strongest confirmation of it I am acquainted withal, and this is one of the reasons why I undertake to describe their peculiarities. The task, though a difficult is not a disagreeable one, for with them the present is everything, they take no note of the past, and a people whose ideas scarcely soar beyond the regions in which they reside, and the requirements of their daily wants, exhibit a character of stability and permanence which is rarely found in more civilized or accessible localities. For these and other reasons which will disclose themselves as we advance, I am induced to hope that the investigation will prove itself as attractive to others as it has been interesting to me; and the novelty

of the subject must palliate, if it does not altogether excuse any imperfections my treatment of it may betray. The tenor of my criticisms on others will show that I am anxious to be accurate myself. I have no taste for florid embellishment, or hyperbolical description, and " travellers' tales" are an abomination in my sight. Fortunately there is not much room for either of these in the instance here referred to. The incidents of the situation are remarkable enough without being enhanced by artifice or exaggerated by fancy, and it is confessedly difficult for a stranger—however qualified on other grounds—to master the details of domestic life, or acquire a knowledge of the political institutions and social usages of a people with whose language he is at best but imperfectly acquainted, and whose literature, if any such exist, is closed against him. If this can be said—as it may be[a]—with any degree of certainty of a highly civilized community whose annals are known from " China to Peru," whose works of art may have been the admiration of millions, and whose poets and preachers have left an indelible mark on the history of the world, with how much more force will it apply in the present instance, and operate in favour of lenient criticism, and indulgent comment. To both these the writer, conscious of his own shortcomings, lays claim on the score of need, and having premised so much by way of preface he will henceforth allow the narrative to take care of and speak for itself.

My paper, entitled " The Himalayas as a Health Resort," which appeared in the January Number of the *Practitioner*, having been received with some favour by the Press, as holding out a prospect of escape from disease and death for the European soldier in India, it seems desirable that I should continue the subject; and to enable me to do so, with more effect, I will address myself more pointedly in this communication than I could afford to do before, to the general characteristics of the hill country, and the social usages and institutions of its inhabitants. These, though possessing no very decided influence of their own, on the question already discussed, are yet so interesting as to deserve a separate notice, and they will, at least, serve as a connecting link between my main argument, and any further evidence in support of the same I may be able to adduce hereafter. I am aware that this is, perhaps, too ambitious

---

[a] See what Prescott says on this point in an early part of his History of the Conquest of Mexico, and consult further, Mr. now Chief Justice Whiteside's Italy in the Nineteenth Century, in the same direction. I have unfortunately mislaid the notes I made from both these, and the books are not available for reference here.

a flight for such an unpractised writer as I am; but it requires no
very cultivated skill to reproduce in plain language what one has
seen himself or learned from others, and this is the very utmost
that I aspire to.   A traveller who writes to engage the under-
standing or fix the attention of his readers, should possess a perfect
knowledge of his subject, a fluent easy style, uncommon powers of
description, and an easy knack of imparting to others the cream of
what he has seen or recorded himself.   I possess neither of these
qualifications.   My visits to the hills were few and far between;
my opportunities of personal inquiry limited; and my knowledge of
the language, or rather languages of the natives—for in this respect
there is no uniformity—imperfect and unsatisfactory.   Yet, am I
not without proof for what I advance, and though I may not say,
with Cowley, that the time I spent in the Himalayas, was spent in

> " Search of deep philosophy,
>   With eloquence and poesy,"

for such a search would indeed, be vain, I can fully say that it
was not spent in " toys, or lust, or wine," but in the contemplation
of nature's handiwork; in the quest of objects of interest, natural
and artificial; and in such curious intercourse with the natives as my
defective knowledge of their usages and language would enable me
to maintain.   If, on these grounds, I plead for exemption from
criticism, I can, at the same time, lay claim to credit, for rigid accu-
racy, and for an endeavour to delineate what I saw as faithfully as
its nature and my capacity would admit.   What I failed to master
myself, I endeavoured to correct or supplement by inquiry among
friends, who had more time at their command, or made a better
use of it than I could afford to do; and in a search for information
which was so beset with difficulties, I did not hesitate to make use
of the experience of writers, who have acquired, by their superior
linguistic powers, long residence, or other advantages, a right to
speak on the subject, with authority and force.   There is nothing
however, advanced on the authority of either of these which I have
not ascertained or authenticated from other sources myself; and my
thanks are specially due to Mr. Frederick Wilson,[a] of Mussoorie,

_____

[a] Colonel Markham, describing the sport he enjoyed in Mr. Wilson's company, gives the
following interesting account of that gentleman's career:—" My successful sport in the
Himalayas, I attribute mainly to my good fortune in having made acquaintance with
my friend Mr. Wilson, who accompanied me in all my expeditions, and to whose
knowledge of the country and people I was indebted for seeing much, which I should

the able and intelligent pioneer of civilization in Gurwhal—who may be appropriately designated the Crusoe of the Hills, whose name is a household word in the interior, and whose energy and perseverance have enabled him to triumph over difficulties that might well appal a weaker man. To his ready pencil I am indebted for the sketches with which this little paper is illustrated, and to him for the notes on which my narrative is mainly based. What I have to say will be little more than a running commentary on his answers to my inquiries, further pretensions my contribution has none.

Diseases.—Though I have already enumerated many, if not all of those to which the hill people are subject, it yet seems desirable to investigate the matter more fully, and ascertain how far their diffusion is influenced, or their character modified by increased elevation, and a more rarefied temperature. It is acknowledged, on all hands, that such a modification takes place, and diseases such as goitre and cretinism, which are endemic in certain parts of the hills, assume a milder form, or are more localized in the plains. This is, however, only partially true, inasmuch as goitre of a very intractable character exists largely in Oude, Nepaul, and other parts of India; and I was shown at Goojerat—in the Punjab—the scene of Lord Gough's last crushing defeat of the Sikhs—some Cretins, who belonged to a village in that district, in which the disease largely obtained. But I may more appropriately reserve this point for the present, and as regards the existence of epidemic cholera and plague, there can be little doubt, that, while all the evidence at our command, points to importation as the cause of the former, the latter has as clearly been generated in the hills themselves. So little, however, is known of its causation and pathology that I will not further allude to them; and I cannot find anything worth reproducing about either, in the elaborate compilations of Copland and Aitken. According to Mr. Dunlop,[a] of the Bengal Civil Service, to whom

probably otherwise have left unseen. A Yorkshireman from Wakefield, fortune in his early life led him to India (in the 11th Light Dragoons), his health sent him to Landour, from whence he took a journey in the hills. Returned to England, he was unable to forget the life he led in the Himalayas, which had for him an irresistible charm. Not overburthened with money he worked his passage out to Calcutta, and walked straight up to Meerut, a distance of nearly 900 miles in thirty days. From thence to the hills was an easy trip, where he has been a resident for several years."—"Shooting in the Himalayas," page 19.

[a] "Hunting in the Himalayas," page 186. The writings of this gentleman may be recommended for their candid and truthful delineation of native life, and manners in the hills, and for their freedom from that contemptuous disregard and captious criticism of native prejudice and peculiarity which Heber deprecated long ago, and which are

I shall have occasion to refer more than once in the course of this
inquiry. " It appeared during Spring and Autumn in the
Kumaon and Gurwhal hills, and extended on one occasion to
the Rohilcund plains; but I have never met with it, or heard of it
in the hills north of Mussooree. Its advance used to be presaged
by the deaths of domestic animals, and even rats and mice, a sign
well known, I hear in Egypt; and a stricter diagnosis led our
physicians to declare the fact, that the Mahamurree was indentical
with Egyptian plague." He adds, " a commission was appointed
to investigate its causes and treatment; their medicines, however,
proved utterly worthless; but their sanitary measures, though of a
kind only possible in Asia, proved a blessing to the people, in pre-
venting, in many localities, the generation *ab initio* of the poison."
For the proceedings of this commission I sought in vain while in
India, and I have failed in my endeavours to find any exhaustive

even now found in the writings of younger and less experienced travellers. There
must necessarily be many customs and institutions in the East which grate upon our
finer sensibility, if they do not actually shock us by their strangeness; and we are too
stand-off in our dealings with the better class of natives; too exacting and selfish, to be
able to understand their ideas or appreciate their motives. We do not enter sufficiently
into the order of all their ways, or make allowance for their surroundings, and we still,
it is to be feared, cultivate too much "that exclusive and intolerant spirit which makes
the English, wherever they go, a cast by themselves, disliking and disliked by all their
neighbours." "I see," says Heber, "but too many instances daily, and I am convinced
it does us much harm in this country. We are not guilty of injustice and wilful
oppression, but we shut out the natives from our society, and a bullying insolent manner
is continually assumed in speaking to them." Mr. Palgrave speaks to the same effect,
while he pulls down, at the same time, that halo of mysticism and romance, and that
farrago of exaggeration and embellishment which it has been so much the fashion to
employ when treating of the East. But I had better let him speak for himself and
thereby endorse, as far as any such endorsement from me may be required,
his statement. He says, "ideas, which, I regret to say, often appear to me distorted
and exaggerated, prevail in the West regarding our Eastern fellow-men; ideas due, in
part, to the defective observation, perhaps the prejudices of travellers, too pre-occupied
by their own thoughts and fancies to appreciate or even understand, the phases of mind
and manners among nations other than their own; while at times an enthusiastic imagi-
nation has thrown a prismatic colouring over the faded East." Whatever faults or
merits my little essay may betray, it will at least, I hope, be free from the errors and
assumptions enumerated above; if I saw a good deal to dislike, I also saw much to
admire and appreciate in the native character; and what is said within will, I trust,
tend to show that the devil is not as black as he is painted. Further than this, it does
not pretend to go, and he who would understand the East —if any understanding worth
the name can be acquired without personal observation—must study the writers named
above, and add to them Bernier, General Sleeman, Captains Kaye and Taylor, Mr.
Marshman, and the author of the "Rural Annals of Bengal." These are among the
best authorities on the subject, I am acquainted withal, and to these I would refer any
who wish to dive below the surface, or master the complicated relations of oriental life.

account of the disease elsewhere. The evidence in regard of cholera, is, as one might expect, much more copious, and it is easy to see that a disease which has not spared the poor hut of the Esquimaux of Behring's Straits or Baffin's Bay; or the poorer hovel of the more amphibious Laplander of the ice-bound head of the Baltic, which is as fatal amid the frozen snows of Siberia, as it is on the burning sands of India, would not pass by the Himalayas, and such indeed we find to be the case. It has never, however, originated in the hills themselves, and when, as in 1867, it passed over the Himalayan and Suleimani Ranges, and carried off upwards of seven thousand souls in the valley of Cashmere, and possibly treble that number in Caubul, it clearly came from the South, and its passage upwards from the plains was obvious to all. On this point, Mr. Wilson says, " It has never, to my knowledge, or in the memory of any of the natives with whom I am acquainted, originated in the hills; and there is no tradition of its ever having done so. It has been brought up twice since I came here; once by a petty Rajah from the plains, who had a large number of followers, and another time, if I remember rightly, by the Puttialla Rajah and his followers. On both occasions it was confined exclusively to their camps. The Teree Rajah went on a pilgrimage a few years ago to Kedarnath, with a large retinue of retainers and fakeers (religious mendicants) from Hurdwar, and they brought the disease back with them. They lost upwards of one hundred lives in a few days; but the infection did not spread beyond their camp, and even the villages through which the cavalcade passed, escaped it." This is saying a great deal for the climate of the hills, for worse conglomerations of overcrowding and nastiness, are nowhere to be found; and he who, like myself, has once passed through some of their villages,[a] will ever retain a lively recollection of the stench, ordure, and other abominations, which they contain.

[a] " Like the inhabitants of most cold, mountainous and half civilized countries, the Puharies (mountaineers) are extremely dirty; dirty in their persons, in their clothes, their cooking, their dwellings, and in fact in everything. They will wear their clothes for months, without washing, and may often be seen hunting for those little animals, whose presence is the natural consequence. Their religion obliges them to wash their hands and face before eating the morning meal, but it is what we should call a rub and a promise, and the rest of the body is seldom treated to the same indulgence."— A Summer Tour in the Himalayas, edited by Mr. Hume, page 207.

"Strangers need not, however, except when the path leads through them, see any thing of the dirt or disease of hill villages, which appear at a little distance, all that can be desired in picturesque beauty and apparent comfort. . . . I believe that the indescribable amount of dirt and filth of those villages, does, at times, materially

Fever of miasmatic origin prevails in the hills as elsewhere; it generally terminates in a well-defined tertian, and rarely proves fatal. It is for the most part left to nature, or the patient is ordered some spicy condiment of cloves, ginger, black-pepper, or other warm root—which are regarded as medicines by the simple mountaineers; or some wandering cheap-jack mumbles a prayer of exorcism or an incantation over him, and such is the force of fancy there, that the sufferer, like the more favoured individual mentioned elsewhere, is forthwith made whole. It is curious to note, that the febrile disorder which prevails in the lower valleys, is much more fatal to those who reside on the higher ranges, six thousand feet above sea level, and consequently—as is supposed— beyond the reach of malarial influence, than it is to the inhabitants of the infected localities themselves; and the former are extremely loath to leave their dwellings or go down the hill during or soon after the rains. This would seem to show that they believe in the efficacy of altitude; and they are probably shrewd enough to see that a seasoning in a certain locality begets a tolerance of its diseases, which no amount of foresight or preparation on their part could enable them to equal or acquire. Typhus fever is an occasional visitant of both the higher and lower ranges; but it rarely spreads in an epidemic form in either, or proves fatal, and its treatment is left entirely to nature. Of the eruptive fevers, small-pox, measles, miliaria, are all very common, and often very fatal. No particular treatment is resorted to, but the villages in which

affect the health of the inhabitants, but it appears that it is only under certain conditions of the thermometer and barometer, that disease is generated in them. It is quite possible therefore to point to pig-styes where no pests are propagated."—Hunting in the Himalayas, by —— Dunlop, B. C. S., page 185.

With reference to the little weakness referred to in the former note it would appear that a similar infirmity exists in New Zealand ; for Dr. Thompson, describing the condition of their villages says,—" In no village are the senses of sight and smell offended by ordure, but intimate friends are seen performing acts of kindness in the manner practised by the Tartars, who, according to Hakluyt, "cleanse one another's heads and even as they take an animal do eat her."—Story of New Zealand, by the late Surgeon Major Thompson, 58th Regiment, Vol. i., page 209.

These practices appear strange and revolting to our more cultivated intelligence; but some of our customs may and doubtless do appear equally out of place to them, and a remark applied by Dr. Livingstone to the wild and exaggerated descriptions of escapes effected by lion hunters in Africa will apply equally to the East. It is to be feared that, to use his words, "our conduct must often appear to the native mind as a mixture of silliness and insanity," in India as often as it does or did in Africa, and the old phrase is as applicable in the former as it is in the latter, "coelum non animum mutant qui trans mare currunt."

either disease occurs in a virulent form, are placed in quarantine, and inoculation is largely practised for small-pox. They perform this operation by tattooing on the wrists with a bundle of needles, and the result is, as may be anticipated when the disease is severe, often very disastrous. I heard of an instance myself, in which more than half the inhabitants of a village, who were treated in this way, died, and one frequently meets men, aye and women too, who have lost an eye or been otherwise disfigured by this disease. As in the case of cholera, so also in that of small-pox, the latter is almost invariably introduced from the plains, and quarantine and inoculation are the means employed to check its progress, or mitigate the force of its ravages. The inoculators—and the same may be said of the other practioners—are simple Puharies (mountaineers), in whose families the situation is hereditary, and who, when sent for to a village receive a rupee each, by way of retainer, and subsequently their food gratis during their stay in the infected village, and from four to six annas a head (6d. to 8d.) for each person operated on. Some of them declare they can so inoculate as to bring out any required number of pustules, but this statement may be taken for what it is worth, and I have never had any opportunity of testing its truth or falsehood. Vaccination has had the same effect in the Himalayas as elsewhere; and small-pox, which formerly numbered its victims by thousands, is now almost utterly unknown wherever it is practised. The people as a rule, take very kindly to it.

Next in point of frequency come bowel disorders and affections of the stomach, and of these latter pyrosis and gastralgia are the commonest. Diarrhœa, induced, doubtless by cold and the frequent and sudden changes of temperature to which the region is subject, is often complained of, and sometimes proves quite intractable to treatment. Dyspepsia, the result of a too monotonous dietary, prevails, but it rarely produces much distress, and it is often got rid off by one of these noisy eructations to which all orientals seem so partial. Dysentery rarely occurs, owing to the simple and digestible ingredients of their food; but colic is very common, and I have heard of cases of death from symptoms and under circumstances which clearly pointed to the agency of enteritis. The hill men, as one might expect from the nature of their food, which consists in great part of badly ground pulse and grain, resembling though not quite indentical with our beans and oats, made up into a mess with some green vegetables, and seasoned with red pepper,

or fried in a pan like the Scotch cake, are very subject to consti-
pation, and black salt and croton nut are their only purgatives.   Of
these, however, they take enormous quantities, and three large
drops of the oil of the latter, or some handfuls of the former are
moderate doses.   As to castor oil, rhubarb, and such like, thera-
putic agents, they are simply nowhere.   Like people nearer home,
the hill men prefer what appeals directly to their senses; they scout
the doctrine of ' molecular change,' and evince a decided partiality
for strong working physic.   They ask everywhere for " Koneen," but
even that they like to get in large quantities, and they regard, as
worse than useless, all drugs that do not produce an immediate and
palpable effect upon them.   Whatever chances of success Homœo-
pathy might have in the plains, it would have none in the hills;
it would not get salt for its porridge in the Himalayas.

Liver complaints, jaundice, and dropsy are very seldom seen,
and when they do occur they are treated by the actual cautery,
scarification or cupping.   The same may be said of pulmonary and
cardiac complaints, and considering the exacting nature of their
duties, the poor fare and poorer housing, the terrible heights
they have to climb; and the long marches they frequently make,
this general exemption seems surprising.   Yet, such is really the
case, and I sought high and low; among the rich as well as the
very poor, for evidence of any mischief to the heart or lungs,
that could be fairly traced to the more rarefied atmosphere of
the country, or the laborious pursuits of the hill coolies.[a]   Cases
of chronic, bronchitis, emphysema, and asthma are occasionally
seen, but only among the very young or very old; and phthisis,
in our acceptation of the term, is conspicuous by its absence.

[a] What Mr. Darwin says of the labours and rapid recovery from fatigue of the
" Apires " or Chilian miners applies so forcibly to the somewhat similar struggles, and
equally rapid recovery, of the Coolies here referred to, that I am induced to reproduce
it in full.   After describing his visit to one of the mines he adds—" At this time the
Apires were bringing up the usual load twelve times in the day, that is 2,400 pounds
from eighty yards deep, and they were employed in the intervals in breaking and
picking ore.   These men, excepting from accidents, are healthy, and appear cheerful.
   .   .   .   .   They rarely eat meat once a week, and never oftener, and these only the
hard dry charqui.   .   .   .   .   It was quite revolting to see the state in which they
reached the mouth of the mine ; their bodies bent forward, leaning with their arms on
the steps, their legs bowed, their muscles quivering, the perspiration streaming from
their faces over their breasts, their nostrils distended, the corners of their mouth
forcibly drawn back, and the expulsion of their breath most laborious.   After stagger-
ing to the pile of ore and emptying the ' carpacks ' they recovered their breath in two
or three seconds, they wiped the sweat from their brows, and apparently quite fresh
descended the mine again at a quick pace."—Voyage of H. M. Ship " Beagle," p. 341.

Rheumatism is very common in the hills, as may well be expected in so elevated a region, under a cold and changeable sky, and among a people for whom poverty prescribes a scanty covering; but I never met an instance in which the heart was affected by it, and they have no other remedy for it than the actual cautery, though all use with eagerness, the fat of the tiger or leopard, when they can get at either. Of those, diatheses and complications which have been introduced by the march of intellect or the struggle for bread, we need say nothing, as they are almost unknown. It is seldom that one hears of a case of insanity in the hills; but idiotcy is rather common, and I frequently met a class of creatures, who, for want of a better or more scientific designation, might be called "born fools." But the Himalayas are by no means peculiar in this respect, for there are unhappily examples, in large numbers, of that description of persons elsewhere, and it would be well for society and themselves that they were equally harmless.

As noticed before, goitre and even cretinism are met with in the hills, and especially so in the higher ranges, where they are really very common; they are said by some non-professional writers on these subjects, and supposed by the inhabitants themselves to be due to the use of snow water; but Mr. Wilson is more than sceptical on this point, and he says that "goitres of all sizes are met in villages in which the people never touch snow water." He adds, "whether removal of the family to a different locality would have any tendency to eradicate the predisposition of the next generation to it, I have not been able to determine. If a family entirely free from it settle in a village where it is prevalent, the members do not appear to get any tendency to the disease, any way not for several generations. I have given the subject some attention, and feel assured that the disease is to be attributed far more to hereditary tendency than to any local cause." The only remedy the natives resort to, is the old familiar moxa or tinder, which they burn over the tumour, and through which they sometimes succeed in diminishing its bulk, though they do not thereby remove the deformity or subdue the disease. Leprosy also prevails, and is believed, like goitre, &c., to be, in the main, due to hereditary taint. The native doctors know of no remedy for it, though they resort to the use of arsenic, mercury, and the paputa nut, whenever they can, and a medical missionary named Newton, who resides at a place called Subathoo, near Simla, has lately stated in an Indian paper, that, he has treated cases of it, successfully, with acetic acid.

Purulent ophthalmia sometimes becomes epidemic in the interior; and occasionally leads, through the filthy habits of the natives, to the most disastrous consequences. The means employed in its treatment are alum when procurable, black pepper, and a strong decoction of the wild barberry root; but segregation of the affected is never thought of. As in other countries where civilization has never interfered with its thousand and one contrivances, to improve the shape or mar the symmetry of the female frame, the process of labour is soon over, and its completion is not attended with those consequences which are so common elsewhere. Irregularities do, however, occur, and then the usual results follow. Fatal ones are nevertheless very rare, for there is no such thing as meddlesome midwifery in the hills, and the village midwives—of whom there is generally one in every community, and who derive such knowledge as they possess from their mothers—direct their efforts at affording aid, during labour, to manipulating the uterus from without, to kneading and pounding the belly, and administering, from time to time, a strong infusion of clarified butter, or a weak decoction of broom-top, dandelion, or other mild diuretic. As observed elsewhere, menorrhagia is common among the elder women, and anæmia and chlorosis among the younger ones. Both sometimes suckle their children for a period of two or three years, and I have more than once seen a boy, or girl, as the case may be, of from five to six or more years, occasionally resort to his or her mother's breast for support.

Syphilis prevails extensively in the hills, but is especially common wherever the population is very dense; and its ravages and propagation are greatly aided by the filthy habits of the natives. In a

---

[a] Drs. Mouat and Thompson ascribe similar immunity from puerperal consequences to the Andamanese and New Zealand females. The former says,—"This important act must be performed in public. . . . The after birth comes away without assistance, and the mother receives no particular treatment, but after confinement continues her usual mode of life, eating and drinking as before."—Adventures and Researches among the Andaman Islanders, page 294.

With regard to their Southern sisters Dr. Thompson says,—"In sorrow shalt thou bring forth children " is a holy mandate aggravated by civilization; for little suffering have New Zealand women during parturition, and they enter upon their usual avocations twenty-four hours after delivery, often immediately after the child is born. Puerperal convulsions rarely occur, and death seldom overtakes parturient women, although infants often perish."—The Story of New Zealand, Vol. i., page 218.
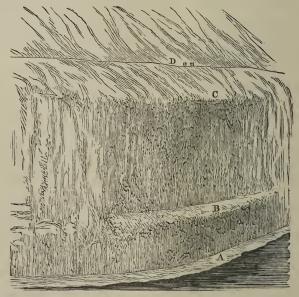
Dr. Livingstone bears similar testimony in regard of the women of Central Africa, and pretty much the same might be said of almost all females who live in what may be called for them a state of nature.

poor and stationary community, wherein the father's trade descends to the son, and the daughter is expected to follow in the footsteps of her mother, it is easy to see that practices which are elsewhere regarded with loathing and aversion, would here be sanctified by the prescription of usage; or stripped of much of their repulsiveness, by the force of habit and the influence of early association. And such we find is really the case. The Hindoo religion gives a certain amount of sanction to the existence of the " social evil," by requiring the presence of common women at some of its ceremonials, and the sensuous apathy and indifference of the Mahommedans, added to their love of pleasure and morbid craving after excitement, supply ample materials for its cultivation and encouragement. But any practice that is productive of profit, which can be indulged in without effort or labour, and which entails no reproach will always command a market in India, and the sense of marital obligation hangs lightly on the shoulders of a woman whose mother " led the way " before her. " C'est le premier pas qui coûte" here, as elsewhere, and there is little occasion for concealment and none for shame among the scattered and secluded valleys of the Himalayas. There are whole villages of prostitutes in the neighbourhood of Almorah and Nynee Tal, who openly solicit travellers as they pass, and if report be true, the dancing girls [a] of Hurdwar and Gangootree can boast of a higher authority for their practices than that of mere local prescription or traditional usage.

But if the denizens of the hills are like their brethren of the plains, liable to disease, they are, on the other hand, endowed with an elasticity of constitution and a vigour of body which enables them to triumph over its seizures, and recover from injuries and accidents that would certainly prove fatal to weaker men. Of such extraordinary recoveries end escapes numerous instances could be given, and several rare ones came under my own notice. On these, however, space will not allow me to dwell, and to save time, I will

---

[a] Mr. Dunlop speaking of the Baz-gees, the professional dancers and singers of the hill temples, says,—" The Baz-gees are a numerous class, have no land of their own, and seldom cultivate. Their dancing is tame and senseless; their music hideous; but their female children form the principle portion of those devoted to the temples, or in other words, and as in other parts of the world, devoted to the priests. . . . These girls were largely supported in the former hill revenue settlements by Government grants of rent free land, and it should not be forgotten that one Government, in its ostensibly liberal-minded and impartial support of the religion of the mild Hindoo, by upholding rent free tenures, is indirectly aiding something more systematically vicious than our "social evil."—Hunting in the Himalayas, page 184.

bring this part of my inquiry to a close with the experience of Mr.
Wilson, who has acquired, by long residence, linguistic skill and
other advantages, a right to speak on this subject, with an exactitude
and an authority which have fallen to the lot of no other Englishman.
In answer to a question, on this head, from myself, he says,—" as
might be expected from their frugal way of living the Puharies
recover in a most wonderful way from the effects of wounds, bruises,
and broken limbs.   A man is now sitting before me in a whole skin,
who, some years ago, fell while going down to the plains to ex-
change salt for grain and sustained a bad compound fracture of one
of his legs.   When brought to me five days afterwards, the wound
was completely alive with maggots and stunk horribly.   Charcoal
poultices and a strong solution of sulphate of copper somewhat
improved its appearance, but the bones remained ununited, and a
medical man who happened to pass by soon afterwards, on his way
to Gangootree said there was not the slightest chance of saving the
limb.   I proposed amputation, but we had no instruments, and on
being asked his opinion as to the result, the Doctor said, the limb
would in time, rot off of itself, but that months might elapse
before that would happen.   This, however, did not happen; on the

contrary the parts united well, and the injured limb is now as
sound as its fellow.   He can carry heavy loads on it, and walk

fifteen or twenty miles a day, without extra fatigue or suffering."
After mentioning other instances of a similar kind, and among
these, describing the case of a boy whose chest was riddled by a
rough rifle bullet, which, entering below the right nipple, came out
behind the left shoulder, and who recovered, without a bad symp-
tom, he adds, " In 1862 I sent one of my Shikaries—natives who
shoot or track game—to shoot musk deer on the other side of the
Ganges. They were unable to execute my orders in consequence
of a heavy snow storm, and of the snow which lay to a depth of
two feet or more on the ground, and when returning along the hill
side, on a slope which extends from the steep rocky hills above to
the narrow gorge in which the Ganges runs at a terrible depth
below, one of them (who was carrying the blankets of the party)
slipped and slid over the ledge into the abyss below, at a place
where an almost perpendicular face of rock falls sheer down to the
water. This, however, will be better seen from the accompanying
sketch than from any description I could give.

Suppose A the bad of the river and from A to C a perpendicular
wall of rock just broken by a slight projection at B, it being some
200 feet from C to B, and at least 100 from B to A. D is the road
on which the party was walking some 50 yards above C. The snow
lay deep on the little projection B, and on the little space between
the water and the foot of the rock at A, and his companions could
see him lying motionless on the latter, and partly in the water.
Having failed to rouse him by shouting and throwing stones, &c.,
they concluded he was dead and returned to me. And no wonder,
seeing that he must have fallen in all, a distance of at least 450
feet, on the surface of a bare rock, which was only relieved from
being sheer by the insignificant projection already referrrd to.
But they counted without their host, and when proceeding on the
following morning, to burn the body and recover the clothes, whom
should they meet but the man himself coming home, and with the
exception of black eyes and a few trifling bruises, none the worse
for his frightful fall." The blankets and snow saved him.[a]

[a] Dr. Livingstone mentions in his book, "The Zambese," p. 463:—The case of a native
woman who, when brought on board " was found to have an arrow head eight or ten
inches long in her back behind the ribs, and slanting up through the diaphragm and left
lung towards the heart. She had been shot from behind while stooping. Air was
coming through the wound, and it was not deemed advisable to attempt any operation.
One of the relatives, however, cut out the arrow and a part of the lung, and, strange to
say, she not only became well, but stout." The late Mr. Guthrie had an idea that
wounds of the diaphragm never healed; but here is an instance to the contrary, and

Customs.—Their customs are, in several respects, peculiar; but as many of these have no direct connexion with the subject under review, I will merely glance at one or two of the more striking ones here, and pass on to more interesting matter. On the first of the Hindoo month of Bysakh—the 11th or 12th of April—there is a festival held on the banks of a river in Gurwhal, at which the inhabitants of all the neighbouring villages assist. The young men on either side fling stones, and shoot blunt arrows at each other across the river with such force and effect as not unfrequently to bring down one or more of their opponents, and fatal accidents have occasionally occurred. At other times they carry about a kind of ark or tabernacle before which the young men and maidens dance and sing as the Abyssinians do in the present day, and as the Jews[a] are said to have done of old, and a practice of sliding from a great heighth, and oftentimes over a bank or precipice several hundred feet deep, is not uncommon in some of the remoter districts. This is effected by fastening a rope made of a long peculiar kind of grass to a pole, and stretching it across a river or other deep gorge. On this some wretched enthusiast, specially provided and primed for the occasion, places himself, and having taken leave of his family and recommended them to the charity of the bystanders, slides down with such rapidity that, should the rope give way or he lose his hold he is instantly precipitated into the hole below and dashed to pieces. I never could ascertain the object or origin of this custom, and it is one which is rarely witnessed by outsiders. The hill men are, as a rule, a hardy well knit race, who are very patient of fatigue, and who are capable of carrying burthens in the hills, which would quite astonish a European. They sling the weight from the shoulders over the back and loins in a kind of basket which they call a kilta, and in a manner from which the kit committee of the British army

ideas, like other things, however highly nurtured, must yield to experience. For equally extraordinary recoveries nearer home see Scottish Tales of a Grandfather.—Black's Ed., pp. 164-367.

[a] "The ancient Jews proudly carried about amongst the relatives the shift of the newly married wife, with the bloody traces on it of the recent injury to the hymen, as a proof of chastity preserved till then, and even yet this custom so prevalent in the East, is a popular custom in Naples, where the 'shift of honour,' (camiscia dell'onore), is exhibited to the friends."—Casper's Forensic Medicine, Vol. ii., page 277. I have heard that a similar custom exists in some parts of the Himalayas, and also among the Black Jews of Malabar and the Indianized Portuguese of Goa; I hear also, on good authority, that it is practised with the usual noisy accessories of drums, cymbals, &c., among the elite of the African savage on the West coast of that continent.

might well take a hint, and in this way often march up hill over mere bridle paths or across the courses of mountain torrents, for a distance of fifteen or twenty miles without any great appearance of depression or fatigue.   Their food in the meantime consists of a little oaten cake seasoned with some spicy herb or green vegetable and washed down with water from the brook.   The women are larger and fairer than their sisters of the plains; and they have a curious plan of quieting their children while absent from them in the fields or elsewhere, which is as simple as it is efficacious, and which baby farmers and others might imitate with advantage nearer home.[a] When a mother goes into a field to work or is otherwise unable to take her child with her, she selects some sheltered spot near a stream, in which she places a little straw for a bed for her infant, and then directs, by means of a piece of split bamboo, a current of water, of from one to two or three inches in diameter on its uncovered occiput and temples.   This produces a soporific effect which generally lasts as long as the water continues to flow.   The sleep is said to be very soothing, and children who have been much subjected to its influence, are known to have been unusually free from the annoyances incidental to the period of dentition.   I came upon a mother thus engaged, on my way to Cashmere, in the hot season of 1867, and she was so entirely absorbed in her occupation, as to be, for some time, quite unconscious of my presence.   During this interval I noticed that, while holding the child with one hand and dabbling water on its head with the other, she now and again rocked it too and fro, and sang at the same time, in a soft plaintive voice, an air which reminded me of the old nursery rhyme, "shoho, lullaby, go to sleep baby," and recalled to my memory with tenfold force, the saying of the great dramatist, "one touch of nature makes the whole world akin."   As soon, however, as she noticed me she snatched up her infant and skuttled away down the ravine with a rapidity and force, which every moment threatened both with destruction.   As might well be expected from their secluded and often solitary existence amid scenes that are more calculated to appeal to the imagination and stimulate the fancy,[b] than impress

[a] Graves quotes a description of this practice as observed by the traveller, Vigne, at Simla in his "Clinical Lectures."

[b] Mr Michie makes some good remarks on this score, which as they confirm the above, and convey my meaning in better language than I could hope to use myself, I here reproduce. "A man who frequently passes days and nights with no society except the howling waste below and the deep blue sky above, has his imagination set free from the trammels of the world of fact.   He has no resources but in the spirit world, and it is

the reason, or call forth the judgment, they are all very superstitious; and they ascribe to supernatural agencies such occurrences as they cannot easily understand, or which are ushered in with any appearances of unusual interest or novelty. They indulge in fact in what might be called " a sort of adventurous credulity, which disdains assenting to obvious truths, and delights in catching at the improbality of circumstances as its best ground of faith;"[a] they raise the unknown into the magnificent, and often 'tis to be feared, like Pope's poor Indian,[b]

> "See God in clouds and hear him in the winds."

But they are not the less interesting for that reason; they are free from many of the worst vices of more favoured latitudes, and I shall ever dwell with pleasure; and often, I hope, recal with something like rapture the incidents of my intercourse with the wild and half savage inhabitants of the Himalayas.

Institutions.—Among these, the most noticeable as it is certainly the most remarkable, is the strange and unnatural custom of Polyandria, which is practised to the almost entire exclusion of other arrangements in Koonawur, and the hill States beyond Simla, in the Bawur Pergunnah and in the British province of Jounsar.[c] It is not, however, confined to these, nor indeed to any

not unnatural that his fancy should people the air with superior intelligences, whose voices are heard in the desert winds, or the rustling leaves of the forest."—Siberian Route from Peking to Petersburgh, p. 196.

The readers of Mr. Buckle's great work need not be reminded of the use he makes of this condition, but he was by no means the first in the field, and his best admirers must allow that he was forestalled by writers who were as old as the Old Testament and Tacitus, and in more modern times by Montesquieu, Hume, Gibbon, Pope, and others.

[a] Curran's speech for Hamilton Rowan.

[b] What Gibbon said of the pious polytheist of ancient Rome might apply with equal propriety to the superstitious Hindoo of the Hills—"Fear, gratitude, and curiosity, a dream, or an omen, a singular disorder, or a distant journey perpetually disposed him to multiply the articles of his belief, and to enlarge the list of his protectors."—The Decline and Fall, Virtue's Ed., vol. I., p. 112.

[c] The author of an interesting book called "A Summer Tour in the Himalayas," says at page 254,—"The unnatural custom of several brothers having but one wife amongst them is universal, and it reflects little credit on our Government, to whom the country is subject, that no attempt has ever been made to induce the people to discontinue the horrible practice." Mr. Dunlop denies its existence in the hills of the Simla superintendency, and he is right if he limits his remarks to the parts of them under British rule, though I believe that the custom obtains even in them. He adds,—"In the Jounsar district when the eldest brother marries, the woman is equally the wife of his younger brothers, though the children are by courtesy called the children of the eldest

particular part of India or the East, for traces of its existence may be found elsewhere, and the particulars given below tend to show that it has found favour in such widely scattered regions as Arabia,[a] Ceylon,[b] Cabool,[c] and South America.[d]   It is also said, though I

brother.   When much difference exists in the ages of the brothers of a family, as for instance when there are six brothers, the elder may be grown up while the younger are but children; the three elder then marry a wife, and when the younger ones come of age they marry another; but the two wives are considered equally the wives of all six," p. 182. Similar, though less detailed information is given in the works of Baron Hugel, Foster, Vigne, Jacquemont, Markham, Torrens, Knight, and others; but their statements could not be quoted here, and the facts are not questioned.

[a] Ockley describing one of the journeys made by the celebrated Omar—the burner as 'tis believed of the Alexandrian library, says,—" Before he (Omar) got to his journey's end, he was informed of an old man that suffered a young one to go partner with him in his wife. So that one of them was to have her four and twenty hours and then the other, and so alternately. Omar having sent for them, and upon examination found them to be Mussulmans, wondered at it, and asked the old man, if he did not know that what he had done was forbidden by the law of God? They both swore that they knew no such thing. Omar asked the old man what made him consent to such a vile thing? who answered that he was in years and his strength failed him, and he had never a son to look after his business, and this young man was very serviceable to him in watering and feeding his camels, and he had recompensed him that way; but since it was unlawful he promised it should be so no more. Omar bid him take his wife by the hand, and told him that nobody had any thing to do with her but himself.   And for your part young man, says he, if ever I find that you come near her again, off goes your head."—Ockley's History of the Saracens, p. 210.

[b] Sir Emerson Tennant decribing, in his Work on Ceylon, a visit he paid to a Kandyan chief, says, "in this instance"—that of the chief just referred to— "the lady was the wife of one husband, but the revolting practice of Polyandria prevails throughout the interior of Ceylon, chiefly amongst the wealthier classes, of whom one woman has frequently three or four husbands, and sometimes as many as seven. The same custom was at one time universal throughout the island, but the influence of the Portuguese and Dutch sufficed to exterminate it in the maritime provinces. As a general rule the husbands are members of the same family, and most frequently brothers." He adds elsewhere. " It has existed from time immemorial in the valley of Cashmere "—such is certainly no longer the case—" in Thibet and in the Sevalik Mountains. It is found in Sylhet and Cachar, amongst the Coorgs of Mysore and the Todas on the Neilgherry hills, and to the present hour it serves to regulate the laws of inheritance amongst the Nairs in the Southern extremity of the Dekhan." As regards one of the tribes—the Todas or Tolas here referred to,—Dr. Shortt of the Madras Medical Service confirms this belief, and the old Shekarry adds in his work entitled "The Hunting Grounds of the Old World," p. 229, —"The women have a plurality of husbands, the brothers of a family marrying one wife, which practice is also common among the Nairs and other castes on the Western Coast."

[c] Sir Alexander Burnes, quotes from Doctor Lord the Medical Officer of the embassy or expedition, that he led into Cabool—pronounced Caubul—or presided over during the years 1836-7-8, who went to Koondooz among the Usbecks to attend the king of that country, as follows :—" Men here sell their wives if they get tired of them. . . On the death of a man his wives all become the property of his next

think on questionable authority, to obtain in certain parts of the Punjab, in some districts near the Godavery, and there is no doubt of its prevalence, on a very extensive, I might indeed add, universal scale, throughout the hilly regions north of Cashmere, and everywhere on the sterile and sparsely populated plains of Ladak. Isolation, poverty, and mountain ranges are believed to be peculiarly favourable to its development, and it is as much cultivated by the Budhists of Thibet as it is by the Hindoos of the Himalayas, or the Todas and Ghonds of Orissa and the Neilgheries who delight in human sacrifices, or live like beasts, " quæ natura prona atque ventri obedientia fixit,"—with no idea of a future. Whether the free and easy manners ascribed by Ferrier,[e] Captain

brother, who may marry or sell them." . . . Jándád, a Kabooli Attari . . . said, " I'll tell you what happened to myself. I was one day returning from Khannabad ; and being overtaken by darkness, halted for the night at Turnáli, three Kos "—about five miles—" short of this. After feeding my horse and going to the house for shelter, I found three men busily engaged, and, inquiring the subject of their conversation, was told that one of them was selling his wife to the other, but that they had not agreed about terms. Meantime Khuda Berdi Ming, Bashi and Chief of the village, came in and whispered to me, that if *I could go halves with him*, he would purchase the woman, as he had seen her and found her very beautiful. I agreed, upon which we purchased her for seventy rupees," (£7 English) " thirty-five each, and she went home with me for that night. Next morning Khuda Berdi came and said that *partnership in a woman* was a bad thing, and asked me how I intended to manage. I said she should stay with me one month and then go to him next. To that he would by no means agree; because if sons or daughters were born there would be disputes to know to whom they belonged. In short said he, do you give me five rupees profit on my share and take her altogether, or I will give you the same profit on your share, and she shall be altogether mine. To this latter alternative I consented, and she is now living with him as every one well knows."—Cabool in 1836-7-8, by Sir Alexander Burnes, p. 198-9.

Describing the manners of the Husaras—a wild tribe of Cabool—he, Doctor Lord, says,—" Inquiries have established that it is the custom of some of the Jaghoorus—who are in consequence fast losing their Tartar features—to give their wives to their guests. Throughout this tribe a stranger may marry for a night or a week, and either leave his wife or take her along with him," p. 232. Where such practices are tolerated, it is no wonder that Polyandria and other more objectionable customs should find acceptance.

[d] See an Abridgment of Humboldt's Travels and Researches that was edited by Professor Magillivray of Aberdeen.

[e] Ferrier, after enumerating the attentions he received in the Scherai or enclosure of a Persian or Kurdistani Chief, says of the ladies of the establishment,—"Their subsequent attentions were remarkable, for they not only assisted at our toilette, but washed our feet, and to my great astonishment subsequently shampooed me from head to foot, and this too in the most free and easy manner possible."—Karavan Journey, &c., p. 232. The custom of washing the feet, &c., of guests has flourished in the East from time immemorial, and those Kurdistani women, whose courtesy Ferrier makes so light of, may have been the descendants, through the Bactrian followers of Alexander, of the Greek slaves whom Homer describes in connexion with the visit of Telemachus

Abbot,[a] Bernier,[b] and others, to the fair maids or matrons of Kurdistan, Khiva, and the hilly tracts near Nepaul, has led to the adoption of this custom, I cannot say; but the spirit and practice of Mahomedans, are everywhere opposed to such an institution, and polygamy, not polyandria, has ever been their delight.

But whatever doubt may exist as to its geographical distribution, there can be none at all as to its antiquity; for is it not, at least, partially sanctioned by the institutes of Menu, and more than merely advocated in the oldest of Hindoo epics the Mahabarat, the heroine of which, Draupadi, was the wife of five Pandu brothers. I am not sufficiently conversant with either the literature or the

and Pisistratus to the court of Menelaus at Sparta. He does not, however, limit *their* attentions to the feet, as clearly appears from the following.—Odyssey, Book IV. verse 49-50-51.

> "Τοὺς δ' ἐπεὶ οὖν δμωαὶ λοῦσαν καὶ Χρῖσαν ἐλαίῳ,
> Ἀμφὶ δ' ἄρα χλαίνας οὔγας βάλον ἠδὲ χιτῶνας,
> Ἐς ῥα θρόνους ἕζοντο παρ' Ἀτρείδην Μενέλαον."

And that this means more than the very diluted version of Pope would imply—

> "Thence to the bath, a beauteous pile, descend :
>   Where a bright damsel train attends the guests
>   With liquid odours, and embroider'd vests,"

must be obvious to any one who understands the original, or who can interpret it with his Liddell and Scott.

[a] Captain Abbot in giving some account of a place called Ghonghrant near Khiva, says,—" Of this town I could learn only particulars relative to the unchastity of the females, who still retain the following remarkable custom. When a traveller enters the city, unmarried girls meet and challenge him to wrestle. The vanquished is obliged to submit to the pleasure of the conqueror. The gross licence of the Kara Keelpank women is proverbial and commences in early childhood."—Narrative of a Journey to Khiva, Vol. ii., p. xxvi., Appendix.

[b] " I shall add what was related to me a few days ago, by a good old man who married a descendant of the ancient kings of Cashmere. At the period when Jehan Guire was making a diligent search after all persons connected with the royal family, this old man effected his escape to the mountains, accompanied by three domestics, scarcely knowing where he was going. Wandering from place to place he found himself at length in the midst of a small but beautiful district, where he was no sooner known than he experienced a cordial reception. The happy man was laden with presents, and in the evening the handsomest girls were presented by their parents, and he was entreated to make his choice from them, that the country might be honoured by his offspring. My friend proceeded to another district in the vicinity and was received with equal kindness and respect; the evening ceremony differed, however, in one particular; as the husbands brought their wives, not the fathers their daughters, observing, that their neighbours were simpletons in having supplied him with the latter, because the children might not continue in their household, but must follow the footsteps of the daughter's future husband."—Bernier's Travels in the Mogul Empire, Vol. ii , p. 163-4.

I am told that some hill Rajahs to this day, give a virgin occasionally to any of their chief men or favourites they wish to honour.

exegesis of the Old Testament to be able to say whether the subject is alluded to therein or not; but I may, I think, venture to say that it is more than once referred to in the poems of Homer,[a] though Mr. Gladstone makes no mention of any such episode, and certain I am, that it was described by Cæsar as prevailing among the ancient Britons. The passage is well known to scholars and is happily so short as to admit of easy reproduction. He says (Oxford Pocket Classics, p. 102)—"Uxores habent deni duodenique inter se communes, et maxime fratres cum fratribus parentesque cum liberis; sed qui sunt ex his nati, eorum habenter liberi, quo primum virgo quæque deducta est." The compiler of the "Annals of England," in the same series, admits that "some of these statements" to wit, those just quoted—"are confirmed by Xiphiline and Herodian, when speaking of the unsubdued tribes in the time of Severus." Lingard is discreetly silent on the point, and I have no other writer of equal authority to refer to, at present, on the subject. Various causes are assigned for the origin of this strange custom, but I believe with Dr. Cayley—whose opportunities of investigating the question in Ladak, have been unprecedented, and who has turned them to good account—that poverty is at the bottom of the arrangement, and any one who has witnessed the struggles and observed the contrivances resorted to by these poor people for the purpose of wresting a scanty subsistence from a sterile soil must come to the same conclusion. Dr. Shortt of the Madras army, speaks, I think, to the same effect, and what I saw of the people who practise it beyond Simla would lead me of itself to a similar inference. Mr. Wilson assured me that "the sterility of the ground had a good deal to do with it," and it is only fair to believe that the propagation of babies is regulated as much by the price of corn in the hills, as it would appear by the statistics of Mr. Buckle to be in our own more favoured clime.[b]   Other reasons are,

[a] Though later inquiry affords no confirmation to this conjecture, I am yet induced to allow this passage to stand as above, that such as may be curious on this point may search for themselves and confirm or refute an impression which I have been led—perhaps too hastily—to entertain for years.

[b] Old Malthus said the same in much terser language before he was born,—"Plenty of rich land to be had for little or nothing, is so powerful a cause of population, as generally to overcome all obstacles."—A Treatise on Population, Vol. ii., p. 190.

The statistics of Ireland prior to the failure of the potato crop and the commencement of emigration prove the same fact, and with regard to the purchase of wives and its consequences I was surprised to find evidence of its existence in that country, at a very early, possibly, mythical period of its history. The "Book of Leinster" alludes to it as

however, assigned for its introduction, and among these must be
enumerated the scarcity of women in these districts, and the neces-
sity of purchasing them as one purchases a sheep or an ox. It
may and doubtless often does happen that when there are several
brothers in a poor family, one or two of them only can afford to
buy a wife, and the Puharies (mountaineers) do not consider a
brother's wife in the light of a sister." On the contrary, they regard
themselves as part owners, and it is easy to see that, under such
circumstances, liaisons may be formed between the younger members
of the household and their elder brother's wife, and Mr. Wilson
assures me that " intercourse with an elder brother's wife is in no
case considered criminal, though the husband often quarrels with
the parties about it." The people themselves believe it originated
in an archery contest which came off at the court of one Drona—a
Hindoo sovereign of paramount power—between five Pandu bro-
thers for a valuable prize, the nature of which was unknown, and
which the brothers agreed to share among them. The eldest of
the brothers did win and received as his reward the king's daughter
Draupadi, and she was so beautiful that each of the brothers in-
sisted upon his right to share her favours, and neither would yield
in this respect to the others. The consequence was that they agreed
to possess her in common, and she was doubtless very much sur-
prised at finding herself the wife of five instead of one husband.
Sir Emerson Tennant, or the writer of the book on Ceylon, which
has been ascribed to him, ascribes its introduction into that island to
the influence of the feudal system, and says, "according to the notion
of the Singalese the practice originated in the feudal times, when,
as is alleged, their rice lands would have gone to destruction during
the long absence enforced on the people by the duty of personal
attendance on the king and the high chiefs, had not some interested

follows:—" From the Cin of Drom Snechta, this below, historians say that there were
exiles of Hebrew women in Erinn at the coming of the sons of Milesius, who had been
driven by a sea tempest into the ocean of the Tirene sea. They were in Erinn before
the sons of Milesius. They said, however, to the sons of Milesius (who appeared to
have pressed marriage on them), that they preferred their own country, and that they
would not abandon it, without receiving dowry for alliance with them. It is from this
circumstance that it is *the men that purchased wives* in Erinn for ever; whilst it is the
husbands that are purchased by the wives throughout the world besides."—See a His-
tory of the Kingdom of Kerry, by M. F. Cusack, p. 18-19-20. I am glad to find from
another and more authentic sourse that the "sad practice of polyandria shows a ten-
dency to die out" in the higher Himalayas.—See the Hill Tribes. An Essay by the
Rev. J. N. Merk, in the Report of the Punjab Missionary Conference, 1862-63, p.
254-5.

party been left to conduct their tillage. Hence, the community of property led eventually to the community of wives." Whether this was so or not in Ceylon I cannot say, there are no records available for reference on the point, and its origin there is now lost in the mist of ages. But whatever may have been its cause elsewhere I feel satisfied, as I said before, that poverty and the " purchase system " are at the bottom of it in the Himalayas, and this too is the opinion of every one competent to give an opinion, with whom I have spoken on the subject. As to its effects little need be said, and that little can scarcely be said to redound to its credit, or divest it of the reproach which must ever attach to its practice. According to the last named writer attempts have of late been made to exterminate it in Ceylon, " on the plea that—like the law of entail in this country, it prevents the subdivision of estates, the children of these promiscuous marriages, however numerous, being the recognized heirs of all the husbands." Mr. Wilson, writing to me on the same subject, says,—" Of the effects of it I cannot say much. I have been a good deal in Koonawur, and am obliged to say that in appearance the Koonawurrees are a fine-looking race of men. They would certainly be classed before the inhabitants of many other countries in the hills, and, what is rather singular, the country is rather more densely populated in comparison than this of Gurwhal, although it is far more sterile." Mr. Wilson says nothing of the relative proportion of the sexes; there is a striking disparity, nevertheless, and all the travellers in Ladak and through the hilly country between Simla and Cashmere in which this custom prevails, with whom I have conversed on the subject, have assured me, that they everywhere counted half a dozen men to every woman. Mr. Dunlop of the Bengal Civil Service—a very competent authority—noticed the same preponderance on the part of the male population, and endeavours to account for it by supposing that " nature's adaptability to national habit had more to do with it than the practice of infanticide or the purchase of wives."[a] He adds in his able book,—" Hunting in the

[a] Apropos of this point Captain Burton says in his " City of the Saints," " of the three forms that unite the sexes, polygamy increases, whilst monogamy balances, and polyandry diminishes progeny. The former, as Montesquieu acutely suggested, acts inversely to the latter, by causing a preponderance of female over male births," un fait important a noter, says M. Remy, " C'est qu'il y a en Utah beaucoup plus de naissances de filles que de garçons, resultat opposè a cet qu'on observe dans tous les pays ou monogamie est pratiquèe; et parfaitment conforme à ce qu'on a remarquè chez les polygames Mussulmans." M. Remy's statement is distinctly affirmed by Mr. Hyde,
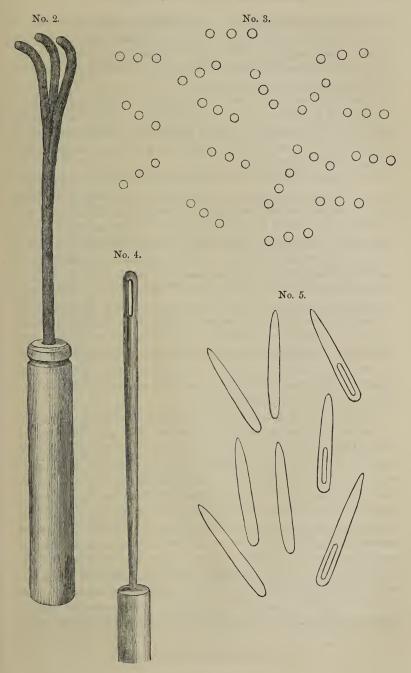
Himalayas," page 182,—" It is remarkable that wherever the practice of polyandria exists, there is a striking discrepance in the proportion of the sexes among young children, as well as adults; thus in a village where I have found upwards of four hundred boys, there were only one hundred and twenty girls; yet the temptation to female infanticide, owing to expensive marriages and extravagant dowries, are not found in the hills, where the marriages are comparatively inexpensive, and where the wife, instead of bringing a large dowry, is usually purchased for a considerable sum, from her parents." Whatever may be the explanation of the phenomenon, there can be no doubt as to the fact, and our plastic mother nature has proved in this as in many other instances, that she can still adpat the supply to the demand, and meet the requirements of her sons, of whatever complexion they may be. She is no respecter of persons, for she dispenses her favours with equal impartiality "to men of every country and party and rank and religion," and colour and climate form no exception to her rule. She is as liberal, in this respect, to the savage as to the civilized; to the black as to the white; to the bond as to the free; and scanty living and hard toil have ever been more favourable to procreation than the condition of those who wear fine linen and fare sumptuously, like Dives, every day.

The Healing Art.—As may well be expected, this must necessarily be very imperfect, and the wonder is that in so secluded a region, they have hit upon any expedients or devised any means for the mitigation of suffering or the relief of disease. And such we find to be, with one or two notable exceptions, really the case. I have elsewhere referred to their skill in removing stone from the bladder, and this is almost the only great operation their surgeons undertake. A writer already quoted with favour more than once, describing their therapeutic appliances, says,—" Scarcely a single natural product in their extensive vegetable world is known to the Puharies to possess any medicinal quality. In surgery they are a little more advanced, as they manage to set broken limbs, to cup, and perform

the Mormon apostle, and there can be no doubt that " in lands where polyandry is the rule, there is a striking discrepancy in the proportions of the sexes among young children as well as adults." On the other hand wherever polygamy prevails, "there is a surplus of female children." See further the strange letter on the advantages of polygamy, by Mrs. Belinda Pratt, which is given in full by Burten, Mr Olmsted's very interesting work, "The Sea Board Slave States," page 220. Malthus on Population, and better still Tacitus, " De Moribus Germanorum " passim. Mr. Hepworth Dixon's " New America, " and " Thirty-three Years in Tasmania and Australia," by G. T. Loyd, p. 289, may also be referred to in connexion with the subject.

other operations; but they have no ointments, and do not even know how to make a common poultice, all they use being made from green herbs bruised on a stone, or the simple raw turpentine of the pine tree, but from their ignorance of its particular properties, they apply it indiscriminately, and hence their sores and wounds often get into a frightful condition." But if the " art and mystery of an apothecary " be but little known or cultivated among them, they appear nevertheless to get on pretty well in spite of their ignorance, and it will be seen as we advance that they have stumbled on a few processes which are as simple as they are said to be effectual, and which, at any rate, seem to subserve their purposes. " The people about the Jumna and Tonsee rivers, have," says Mr. Wilson, " a rather curious way of treating a common headache. They place the sharp edge of a razor against the forehead, and give the back a fillip with the finger, and thus bleed themselves. In hot weather I have known some of my own workmen do it every day for nearly a month. Another remedy for headache is, to lie down by the fire, and with the forehead as near to it as bearable. It is a very good one I believe. I have tried it myself with success when my own remedy failed."[a] But whatever they may lack in manipulative skill, or in the discrimination of disease they make good by the readiness with which they resort to more powerful agents, and by the safety with which they enforce a dangerous though favourite remedy. That remedy is the actual cautery, and I cannot better describe their general manner of using and applying it, than in the words of the writer whom I have so often quoted before, and who appears to me to possess a minuter and more authentic knowledge of the hill men and their ways than any other I have seen. He says,—" The actual cautery is their best and most universal remedy for pains of almost every description, and they apply it for rheumatism, pains in the side or stomach, liver complaints, and many internal diseases, without the least scruple. Infants but a few days old, if they appear to be uneasy, are at once severely cauterized over the stomach, and certainly no bad effects ever appear to follow such an off-hand procedure. The general way of applying it is to rub the part with a handful of cold wood ashes, and then strike it repeatedly with a piece of red hot iron, something with

a Sir Samuel Baker describes a somewhat similar process as existing among the tribes he visited in Africa. He says of them,—"The treatment of headache among all the savage tribes was a simple cauterization of the forehead on spots burnt with a hot iron close to the roots of the hair."—Albert Nyauza, Vol. i., p. 274.

No. 2.

No. 3.

No. 4.

No. 5.

a rounded point being selected.   Another but more painful method
is to put a piece of lighted tinder on the part and allow it to
consume itself away."[a]   Those who "go in" for more scientific
surgery use a three-pronged trident-shaped instrument, like Figure
No. 2, but at least double the size.

Should this be not at hand, a substitute is easily extemporized
through the handle of an iron ladle, a rusty knife, or reaping
hook, or the like, and the marks produced by the former when
it is struck rapidly on the flesh, are represented on a considerably
reduced scale in Figure No. 3.

" It would be difficult to mention," says Mr. Wilson in a letter
to myself, " any one disease accompanied by internal or external
pain in which the actual cautery is not employed.   It is one of the
first things thought of in almost every case.   If a new-born infant
cries much, it is at once applied to the poor thing's stomach, and I
must say without any ill effect.   All the children in this part of
the hills, without any exception, have it applied once or twice, a
few days after birth, all over the belly."   The Puhary Doctors are,
of course, wise enough in their generation to know that they dare
not use the same rough method with an infant in the cradle which
they used, perhaps, on its father, a few days before in the fields.
They discard accordingly the rough-looking machine figured above,
and substitute instead a needle, which is stuck, by its point into
a piece of stick, and which when ready for use *may* resemble the
thing—too finely—sketched in No. 4.

They heat this to a red heat in a charcoal fire, and then apply it,
over ashes, lengthwise, on the abdomen or other part, from ten to
twenty times, or oftener.   The operation is often repeated several
times in the course of a few days, and the result is a series of
stains or tracings like those represented in No. 5, which
grow with the growth of the child, till they become part and
parcel of its integument, and which I have counted, in all their
ugliness, on the belly of a man far advanced in years.   As to its
general effects, Mr. Wilson says,—" there can be no doubt that the
employment of the actual cautery in the way followed by the
Puharies, is more or less beneficial in the vast majority of cases,
and I cannot call to mind any injurious result from its use.   When
it does no good, it seems to do no harm," a very negative qualifi-
cation certainly, and only a left-handed compliment at the best;

---

[a] A Summer Tour in the Himalayas, p. 211-12.

and yet one which could not always be alleged of some of our own more costly or belauded apparatus and proceedings.

But though the actual cautery is, as we have just seen, a very favourite remedy in the Himalayas, its employment is by no means confined to them, and what Mr. Palgrave says of its use in Arabia is equally applicable to other and widely different parts of the world. That able writer, describing the medical skill and medicines of the Arabs of Central Arabia, says, in his interesting " Travels," Vol. i., p. 149:—" One only remedy is lavishly employed and borne with amazing patience—the actual cautery. Whatever be the ailment, wherever the pain fixes itself, the hot iron is forthwith applied, and should an individual be so unlucky or so unadivsed as to complain of pain ' all over,' he is pretty sure to be scarred all over also;" and the late Major Macpherson says, of the savage Ghonds or Khonds of Orissa, " they apply in extreme cases the actual cautery to the belly, using a hot sickle over a wetted cloth." Similar testimony as to the universality of its use in Cabool is borne by Dr. Bellew,[a] of the Indian Army, who was shut up in Candahar during the mutiny in 1857; by Sir Rutherford Aldcock [a] and Mr. Hodgson,[b] in respect of Japan; by Dr. Rose,[c] R. N., in the case of China; and by the late Dr. Thompson,[d] in that of New Zealand. These are, however, comparatively civilized people, and therefore more likely to adopt the arts and appliances of civilized life; but we find it in use by others whose range of cultivation and

[a] I have mislaid the extracts made from the works of Dr. Bellew and Sir Rutherford Aldcock, but of the fact I have no doubt.

[b] Mr. Hodgson says of Japan:—" Acupunc—practised by blind men on the muscles with a thin needle, often three inches in length, for the relief of muscular rheumatism—was introduced, I believe, long long ago, into Europe from Japan. Moxas are still burnt in Japan, and it is not rare to see the back of a man in summer, whose skin is one mass of dark coloured spots. This is practised on every one, high and poor, and is not so painful as I should have imagined, if I may judge from the frequency of its application."—A Residence at Nagasaki and Hakodati in 1859-60, by C. Pemberton Hodgson, late H. B. M.'s Consul, p. 233.

[c] " The principle of revulsion and counter-irritation is carried out by the natives (of China) in the treatment of all their internal diseases. This is effected by blistering through means of a preparation made from a fly somewhat similar to our own cantharis, kneading the surface of the body with the knuckles and pinching the skin with the fingers and copper coins, until the part becomes livid."—See a paper in the Lancet for June 14th, 1862, entitled, " Medical and Topographical Notes on China," by John Rose, A.M., M.D., Surgeon R. N.

[d] Dr. Thompson says of the New Zealanders :—" They—the natives—treated lumbago by rolling heated stones over the loins." It is no uncommon thing to see Coolies in the hills walking and stamping on each other after a fatiguing march, and I have been subjected to a similar process myself with relief.

intelligence is much less, and among these we may include, on the authority of the Abbé Domineck, the Dacotas of Central America, the wild tribes of the Rocky Mountains, as described by Burton, and the naked savages of the Philippine Islands whom Sir John Bowring visited.[a] Even in the centre of benighted Africa,[b] the value of counter-irritation by scarification, &c., is recognized, and I cannot help thinking that a remedy which has found such wide and universal favour in such remote and distant quarters, and under circumstances so various and conflicting, is worthy of greater accept-ance and a more frequent application than the sceptical writings of Drs. Dickinson, Anstie, and others of that advanced school would recommend. It has been used with benefit in such widely different diseases, as cholera[c] and snake bite,[d] inflammatory fever and Guinea worm,[e] and the native Hakeems or Doctors of the plains of India, are in the habit of using it as much for men as for beasts, and with generally very satisfactory results in both instances. Indeed it is so common a practice with and among natives and their cattle as to be almost a matter of daily observation in the fields, on the line of march, and wherever else camels, elephants, bullocks, and horses most do congregate. Mr. Connolly, a very

[a] Abbé Domineck describes the Dacotas as "successful in the application of friction, douches, fumigations, and sinapisms." Captain Burton in his "City of the Saints," p. 145, describing the surgery of the Indians of the Rocky Mountains, says,—"wounds are dressed with astringent herbs, and inflammations are reduced by scarification and the actual cautery;" and Sir John Bowring, F.R.S., says of the Indians of the Philippine Islands, "they apply hot iron to counteract severe local pain, so that the flesh becomes cauterized."—A visit to the Philippine Isles, by Sir John Bowring, F.R.S., p. 178.

[b] See Dr. Livingstone's Missionary Travels and Researches in South Africa, including a Sketch of Sixteen Years' Residence in the Interior of Africa, p. 89.

[c] It is related in that strange production " The Travels and Adventures of the Rev. Joseph Wolff, D.D., p. 449, that while travelling in India he was seized with cholera, and the symptoms becoming too urgent for ordinary remedies, the surgeon in atten-dance Dr. Cooper, said to him 'Wolff, the natives have a remedy which has very frequently succeeded in stopping the cholera, and this is putting a hot iron upon the stomach,' and he added ' will you submit to that?' Wolff said 'yes.' He then branded Wolff three times upon his stomach, which—God be praised—stopped the cholera, and Wolff began to sleep."

[d] See the "Autobiography of a Mahomedan Gentleman, Lutfullah," for particulars on this head.

[e] Mr. Petherick describing the remedies resorted to by the inhabitants of the Soudan, &c., says,—"A dose of butter and burning with a hot iron when suffering from internal pain are the grand remedies at the command of the Nomades and the bulk of the people." And again, "in all inflammatory diseases, the hot iron is the universal remedy, and in Guinea worm is a never-failing one."—Travels in Egypt, the Soudan and Central Africa, pp. 333 and 334.

experienced and intelligent apothecary, who was attached to the
88th Regiment, during the earlier years of my connexion with it,
assured me that (the late) Dr. Jephson and Dr. Morehead were
very partial to its use in the 87th Regiment, when he was attached
to it, and in confirmation of its value and their success he added that
" when the treatment was commenced there were in hospital thirty
cases or more of chronic rheumatism, lumbago, &c., and within a
fortnight the number was reduced to four or thereabouts, and these
were persons of broken down health, or who were kept in for the
purpose of being invalided." The apparatus used was simply a bolus
knife or the *post mortem* case hammer heated either over a spirit lamp,
or by being thrust into boiling hot water, and with these simple in-
struments, I have myself sent several men to their duty who would
otherwise have, in all probability, to be invalided.   But military
surgeons have always, and perhaps for reasons which will require
very little explanation and no apology, been greater advocates of
this process than their civilian brethren; the late Mr. Guthrie
frequently resorted to it for aid; Sir George Ballingall has recorded
an opinion in its favour, and I find the following at page 150 of a
tract entitled, " What is Homœopathy?" by William Sharp, F.R.S.,
anent the practice of their great contemporary and confrére, the
celebrated Baron Larrey.   Mr. Sharp says:—" In the year 1827,
I attended the hospital in Paris which was in charge of Baron
Larrey, Senior Surgeon to the Army of Napoleon.   At every
morning's visit he had among his numerous attendants two
'internes,' or dressers as they are called at the London hospitals,
accoutred in this manner—one carried a small chafing dish with fire
on it, the other a box containing a number of actual cauteries—
irons like small pokers—and a pair of bellows.   As we passed from
bed to bed, one or more of the suffering occupants was sure to be
ordered the cautery, when one of the irons was sure to be placed in
the chafing dish, the bellows wind applied, and as soon as the
instrument was brilliantly red hot, the Baron would take it in his
hand, and deliberately draw two or three lines on the flesh of the
patient, very like the marks with which most of us are familiar,
made by the ordnance surveyors, on our houses and pavements,
during their late labours in all parts of the country." This is
surely testimony enough in favour of the practice, and it is more-
over, perhaps, as much as I need or ought to say on the subject at
present.

For the rest the brown man of the hills differs but little, if at all,

from his blacker brother of the plains, for nature, their common
mother, is the same everywhere, and she is very impartial in the
distribution of her favours. Each has his own peculiarity and his
own ways, " in magna copia rerum," says Sallust, " aliud alii
natura iter ostendit," and however they may differ in minor points,
there is a " fellow-feeling " between them in the back-ground, and
a unity of purpose and of action which clearly shows that they be-
longed originally to the same stock. " White man, black man, red
man, yellow man, each has," to use the words of Mr. Dixon, " a
custom of his own to follow, a genius of his own to prove, a con-
science of his own to respect." Yes, " no matter what complexion
incompatible with freedom an Indian or an African sun may have
burnt upon him," he still retains the primal impress, physical man is
everywhere the same, and it is only the various operation of moral
causes that gives variety to the social or individual character of each.
The reasoning faculty and the capacity for improvement may be
greater in one instance than in another; education has probably
increased the one; climate or constitution may have modified the
other; but the foundation on which both rest, or from which they
emanate, continues unchanged, and man remains the same in " all
weathers."[a] To prove this is one of the objects of the writer of this
little paper; how far he has failed or succeeded in the execution of
his task must be determined by others.

[a] The philosophic Surgeon, Robert Jackson, whose great soul would reflect credit
upon any service, and whose writings are, I venture to think, too much neglected by
his successors, put this in a form and phraseology which will justify me in reproducing
both in full here :—" Man," he says, " differs in appearance—attains maturity earlier or
later—acquires perfection in a higher or lower degree—in some climates than in others ;
but he is fundamentally the same animal in all, and possesses through all the same
foundation of constitution, on which are built his virtues or his vices. Climate operates
in bringing forth or in repressing his perfections, but the original badge remains un-
changed; he does not forfeit his claim to nationality by contingent divergence, or casual
estrangement, and the fabric once laid retains its outline with tolerable uniformity to
the end."

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

------- ◆ -------

The Descent of Man, and Selection in Relation to Sex. By
CHARLES DARWIN, M.A., F.R.S., &c. 2 vols., with illus-
trations. London : John Murray. 1871.

THE advent of this new book of Mr. Darwin's has been anxiously
looked forward to by all interested in questions of Zoology or
Ethnology; coming as it does from one who occupies such a
definite position in the world of science, and with the evident
marks of care in its compilation which it shows, such a work is the
more deserving of our notice, as it has not been hurriedly put
together or carelessly written.

As it is now thirteen years since the "Origin of Species"
appeared, and as the subjects considered in that work have been
the theme of many critics, and the basis of many investigations in
the interval, this work of Mr. Darwin's is also interesting as an
evidence of how far the author maintains his original position in
relation to the criticisms, adverse and otherwise, which have
assailed or applauded his theory. To the great majority of readers
the first 250 pages of this book will be the part of the greatest
interest, as the latter section, on sexual selection, though bearing
the marks of the great erudition which so eminently distinguishes
the author, yet does not as directly touch on subjects of so great
or so general importance as the first part.

Mr. Darwin holds a high rank in the midst of naturalists as one
of the leaders of the great and daily increasing school of evolu-
tionists : he is the apostle of a special form of the evolution philo-
sophy, based on a more circumscribed foundation than evolution
in general as taught by other masters. The common ground upon
which the holders of this philosophy unite may be briefly stated
thus :—The present condition of nature is a result produced by the
constant action of forces subject to definite laws ; the present
forms of living beings, animate or vegetal, are the modified descen-
dants of a simpler ancestry ; that they have attained their present

conditions through the agencies of such causes as we call natural, and in modes so regular that the processes of their production can be expressed in the form of general statements or laws. While Buffon, Lamarck, and Le Maillet, held theories of evolution in common with Darwin, Häckel, and Mivart, yet the forms of the doctrine are not to be confounded. The older developmentalists followed Lamarck in regarding the progressive changes in living forms as volitional to a certain extent, at least, and this idea is brought out in that curiously fanciful production, the "Telliamed." With the modern evolutionists, volition counts for little or nothing as a factor, but they regard changes as depending on the concourse of internal and external conditions, to each of which they individually assign a varying amount of importance. Mr. Darwin regards, as the forces of the greatest power in producing permanent specific change, the survival of the fittest of the individual varieties of a stock, in the struggle for life, and the tendency of individual peculiarities, to be transmitted hereditarily, and in these consist the specific character of the Darwinian theory, hence those that confound the older and more modern theories betray a gross ignorance of the subject.

The history of this doctrine of evolution differs in respect from the general history of many new scientific opinions, propounded at first crudely in the days of the "Philosophic Zoologique," and the "Vestiges of Creation;" it was seized upon by sceptics as a formidable weapon wherewith to assail revelation, but the very grossness with which it was put forward in those imperfect states of scientific knowledge rendered it obnoxious to successful attack; but now, after the foundations of its original form have been beaten down, from its ruins the newer evolution philosophy has started up on a broader basis, and built up with the skill of a more scientific architecture. In this country the general subject has received its most perfect elucidation at the hands of Mr. Herbert Spencer in his series of works on the subject,[a] and in Germany it has been made the subject of two able works by Professor Häckel, of Jena;[b] but these two exponents do not coincide in all their views respecting the system or its relations. The negative character of Mr. Spencer's philosophy is, perhaps, its most marked feature, and his uncompromising severance of what he regards as unthinkable and

[a] First Principles, 1867; Principles of Psychology, 1855; Principles of Biology, 1864.
[b] Generelle Morphologie, 1866; Natürliche Schöpfungs geschichte, Berlin, 1868.

unknowable, from the domain of scientific inquiry, show that the school of biological rationalists, of which he is the apostle, manifests a tendency towards what amounts to a modified positivism. Häckel, on the other hand, conducts us to pure materialism, as the foundation of his scheme of nature. As an illustration of the different manners in which these writers deal with their subjects, we find the first mentioned author saying, with regard to subjective psychology, that consciousness is a subject-matter radically-distinct in its nature from the subject-matter of biology in general, and though he in a measure qualifies this, yet he allows the differences to be such as to compel us to deal with the two as forming at least independent sub-sciences.[a] Häckel, in referring to the same subject, says[b]:—"Auf keinem Gebiete der Zoologie wird diese erkenntniss grössere umwälzungen hervorbringen als auf demjenigen der thierischen Psychologie, auf welche wir nothwendig jetzt noch zuletst einen besonderen blick werfen müssen. Den gerade die Seelenlehre der Thiere hat sich in grösserer Isolirung entwickelt , und ist daher auch in stärkerem, Rückstande geblieben, als alle übrigen Zweige der Zoologie. Hat ja selbst die menschlische Psychologie, von welcher doch alle vergleichende Psychologie der Thiere immer erst ausgegangen ist, sich bisher fast ganz im Dienste einer speculativen Philosophie entwickelt, welche die unentbehrlichen Fundamente der empirischen Physiologie von vornherein verschmähte. Was würden wir heutzutage von einem Botaniker sagen, der das Seelenleben der Pflanzen von ihren übrigen Lebenserscheinungen trennen, und das Studium der letzteren der empirischen Physiologie, dasjenege der ersten aber der speculativen Philosophie zuweisen wollte ?"

Mr. Darwin, though a thorough evolutionist and a thorough naturalist, and, in his own way, a systematic philosopher, endeavours to establish his own views by a course of simple induction from an immense assemblage of facts, and falls in more closely with Häckel than with Spencer. Now, any one who holds the evolution hypothesis must be brought face to face with the question of the origin of man. Man is sufficiently an animal to form part of the zoologist's domain, and if we profess to account for the origin of the other species we have no ground to put man out of the question, and it is this very consideration which chiefly gives such an interest to the evolution controversy ; were it not for this,

[a] Principles of Biology, Vol. i., p. 99.
[b] Jenaische Zeitschrift, 1870, p. 367.

development would be to the general public of as little interest as any other special doctrine of science; it is this part of its consideration in the concrete which renders the abstract question of vital importance. As far as possible this should be regarded as a matter of pure science, and should be considered apart from any intermixture of evidence from revelation, not because we consider the latter as of no force, far from it, but because it is always safer to pursue questions of science as such, and we think it not judicious to introduce religion into what are plainly matters of pure science, for " philosophy being not a matter of faith but reason, men ought not to affect to derive it from revelation, and by that very pretence seek to impose it tyrannically on the minds of men which God hath here purposely left free to the use of their own faculties, that so finding out truth by them, they might enjoy that pleasure and satisfaction which arise from thence."[a]

Different theories of the origin of man have been held by many naturalists : some regarding the human race as one species, others as two, three, five, or many species. On evolutional grounds we have no basis for any theory involving a plurality of origins ; the most dissimilar races of men are not separated from each other by any characters, the like to which we do not experience in varieties undoubtedly derived from a single common species. We may then simplify our study, as we are at present endeavouring to look at the matter as much as possible from an evolution stand-point, and regarding man as a single species, examine into the scientific evidence concerning his origin. But even in this regard we cannot enter on the question without understanding something of man's nature. Man differs from the other animals not only in several well marked characters of body, but also, and to a far greater extent, in psychological characters ; and any theory which professes to account for his origin must account for his endowments psychical as well as physical.

We may group the proposed theories under three heads :—

I. The creation theory : that man as a whole emerged from the hand of the Creator as we find him ;

II. The pure evolution theory : that man's entire being was produced from some lower form by the gradual action of natural forces ;

III. The mixed evolution theory : that man consists of two

---

[a] Cudworth, Intellectual System of the Universe, Vol. i., p. 21.

parts which have had separate originals, a body evolved from a pre-existing form by the action of natural forces, and a soul a special creation bestowed upon him directly by his Creator.

Before proceeding to the direct discussion of these three theories, there are a few general considerations which require to be noticed. There is a common popular fallacy regarding the evolution doctrine so absurd that it scarcely deserves to be mentioned were it not that it is used to throw ridicule on it, namely, that any *direct* genetic affinity subsists between different existing species ; a doctrine which no scientific evolutionist ever propounded. They regard living species as the terminals of the branches of the great tree of living forms, each species as the end of a series, the gorilla as much as the man, and only connected to their congeners through the main trunk. The gorilla has no place in the direct genealogical line of the man according to any author, the two genealogies can be only connected by having a common starting point, from which the latter has diverged as much as the former.

All theories of the mutual relationships of so-called species, the creational as well as the evolutional, are founded on analogy. We find in nature individuals only, and we require to collect from these evidences as to their affinities ; these evidences are drawn— 1st, from relations in outward form; 2nd, from relations in internal structure ; 3rd, from the absolute variation noticed in the descendants of one set of parents, and especially from the effects of external conditions in inducing such change; 4th, from the relations of the changes gone through by different forms in the course of individual development. It would be foreign to the purpose of the present paper to delay to give illustrations of these methods, as in the works of Darwin, Häckel, Wallace, &c., will be found numerous instances in application of these various ways of determining kinship.

In connexion with this preliminary consideration we may notice a common objection often brought against the evolution hypothesis, namely, it is stated that we do not find species varying at the present day ; but when we take into consideration the first general statement made above, together with the fact that specific distinctions are for the most part purely arbitrary, we see the fallacy of this. Let any one compare any two of the standard British floras—Babington's and Bentham's for instance—and see what will be the result as to his belief in the fixity of species, also in any of the works of the above-named authors on evolution,

many instances of the variations of well marked species will be found.

The study of the origin of man involves two separate lines of investigation. First, the examination of the human body, and the determination, if possible, of its mode of origin; and secondly, the study of the human psychical development and its comparison with the manifestations seen in the study of comparative psychology. These two lines are so distinct that we shall take them up independently.

I. Man has been variously considered by naturalists as making up a kingdom or sub-kingdom separate from the other animals (Goodsir, Swainson, &c.), as making a class in the animal kingdom (Owen), an order (Cuvier), or only a family in the order primates (Linnæus, Huxley, &c.) Whether we consider his characteristics as of ordinal value or no, makes no matter to us now; however, the most practical way of studying them is first to tabulate them; secondly, to examine their range of variation in man; thirdly, to examine the nearest allies of man with a view to see if any of these characters ever appeared in them; and fourthly, we have to study the characters common to man and the primates to see their bearings on the point in doubt.

The characters of man may be tabulated as follows :—

a, Characters of general form : 1, erect position; 2, progression on his hinder limbs; 3, foot developed into an organ of support; 4, hand perfectly relieved from all function as an ordinary organ of progression, and devoted to prehension alone; 5, absence of tail; 6, general bareness of surface, and limitation of the growth of hair to a few localities; 7, perfect opposability of the thumb; 8, proportional shortness of arm; 9, hallux not opposable.

β, Characters of skeleton: 1, great preponderance of brain, case over the face in the skull, causing an increase in the facial angle; 2, projection of the nasal arch; 3, continuity in series and equality of the teeth; 4, zygomatic arches at anterior $\frac{1}{3}$ of skull; 5, several small osseous peculiarities arising from the comparative fore-shortening of the skull, such as horizontality of fronto-ethmoid suture, convergence forwards of the inner orbital walls, shortness of palate, &c.; 6, presence of a series of alternate spinal curves; 7, increased width of the sacrum; 8, shortness of the iliac bones; 9, greater length of thigh bone; 10, capacity of almost perfect extension of hip and knee; 11, larger articular area on the head of the humerus.

γ, Characters of the muscular system : 1, well developed facial muscles; 2, absence of an occipital rhomboid; 3, a dorsi-epitrochlear; 4, presence of a coronoid head of the pronator teres; 5, of a radial origin of the flexor digitorum sublimis; 6, separation of the flexor pollicis longus from the flexor profundus digitorum; 7, presence of an abductor pollicis minor (extensor primi internodii pollicis); 8, limitation of the extensor indicis to the first finger, and 9, of the extensor minimi digiti to the little finger; 10, large size of the erectores spinæ; 11, gluteus maximus exceeding the gluteus minimus in point of size; 12, equality or preponderance of the extensors over the flexors of the knee; 13, the presence of a tibial head to the soleus; 14, presence of a peroneus tertius; 15, simplicity of the tibialis anticus.

δ, Characters of the nervous system are : 1, enormous preponderance of the cerebral hemispheres over-lapping the olfactory lobes and the cerebellum; 2, small size of the olfactory nerves; 3, large size of the pes hippocampi minor, separation of the corpora albicantia into two bodies; 4, horizontality of tentorium.

ε, Characters of the visceral systems : 1, large size and mobility of the arytenoid cartilages; 2, rudimentary laryngeal sacculus; 3, double curvature of the crico-arytenoid articulation; 4, free mobile short tongue; 5, lips protrusible.

These are the only characters which may be regarded as of value in the discrimination of the physical frame of man from that of his congeners, some of them are of very much greater importance than others, those of the skull, of the general surface and outline, are most valuable of all; the only visceral characters of note are those of the larynx, and they are singularly few in importance when we consider the enormous functional difference of the larynx of man from that of the most anthropoid of the primates; there is less difference between the larynx of man and that of the chimpanzee than there is between that of the chimpanzee and the orangoutang. The vascular and splanchnic system do not show us any other points worthy of note. To consider each of these points in detail would be to re-write Darwin's book. What we have rather to do, is to see how the evolutionists in general make out their case in the face of all these differences. Some may be easily disposed of; the group of muscular peculiarities, for instance, affords little difficulty when we consider that there is not a single so-called human peculiarity in the muscular system which has not been found over and over again wanting in man, while the chimpanzee has

been found to show ordinarily the characters marked 2, and occasionally those marked 4, 5, 9, and 13; sometimes in man there have been noticed the absence of groups of human characters, and also the presence of groups of muscular characters usually distinctive of the quadrumanous primates; the osteological distinctions are of more permanence, but even here we find none so fixed as to be incapable of varying. No. 2 is deficient in most negroes in whom the nasal bones, instead of being separate as in Europeans, early unite into a single flat scale of bone as in the anthropoid apes. The peculiarly human spinal curves are absent in the young of the human race, in whom the curves are precisely the same as in the chimpanzee, and many of the other differences are comparative, not absolute. Mr. Darwin shows, what has long been admitted, that the coccyx is a rudimental tail, and, singularly enough, it is still more rudimental in some of the primates, man having four coccygeal bones, while Inuus has only three.

It would be interesting to follow each of these characters according to the two-fold system of analogies above suggested, to see how far these are capable of variety in man, or approached by the lower animals; but we have no space here for any such examination, we can merely say that such a process will show that there is not more difference between man, anatomically, and some of the other primates, the chimpanzee, for instance, than there is between the chimpanzee and hylobates, or macacus, or even the orang.

A plain series of anatomical facts, such as those referred to, leaves us undoubtedly in a position of difficulty regarding the anatomical distinctions of the body of man, so that we are practically compelled to leave the matter thus. If we have any sufficient grounds for believing that two forms like the orang and the chimpanzee have had a common parentage, then, if the same considerations apply to man and the chimpanzee, we must draw a similar conclusion. This is the fairest and most forcible way to put the argument of the evolutionist regarding man.

The supporters of evolution undoubtedly draw their strongest arguments from three anatomical sources :—1, Rudimental structures; 2, variations leading from the human to the simious type; and 3, embryology; and Mr. Darwin well knows how to handle these weapons. The first of these is undoubtedly a very great stumbling-block to any but evolutionists, and the force of the argument may be seen by stating it thus:—We find in some animals,

man for instance, rudiments of structures which, to him, are and cannot but be useless. In other neighbouring forms these same structures are developed and functional. We know that if the use of any part be suspended, it atrophies and becomes thus rudimental; that as varieties have a tendency to be transmitted hereditarily, so the descendants of animals which have any parts diminished by want of use, will have the same parts diminished too. The experiments of Brown-Sequard establish this on an independent basis. Man has some such rudimental organs, therefore they are the wasted representatives of what were function-performing parts in some ancestor. The upholders of evolution have proved, by examples, the undoubted truth of such parts of this argument as the wasting of organs from want of use, and the hereditary transmission of such wasted parts, and in man they point to the following rudimental organs in support of their theory:—

1. The projecting tip of the helix of the ear, rudimental of the pointed ear of animals.

2. The appendix vermiformis cœci.

3. The coccyx or rudimental tail, with its rudimental muscles.

4. The rudimental muscles of the ear, usually only present as functionless traces.

5. The plica semilunaris and lachrymal caruncula of the eye.

6. The platysma and scattered fibres of the panniculus, often present.

7. The psoas parvus muscle, so inconstant in man.

8. The corpora wolffiana of the embryo.

9. The parovarium and sinus pocularis of the male.

10. The sacculus laryngis.

11. The " vestigial fold " of pericardium (Marshall).

12. The " sternalis brutorum."

13. The supra-condyloid ligament or process.

Now how to account for these rudiments on any other but an evolution theory it is very hard to see. No teleological reason for their existence can be given, as they are for no end, perform no function; we can otherwise give no intelligible reason for their presence.

The second argument has been already referred to in speaking of the muscular system, and it undoubtedly is a very forcible one. The third is one equally strong, and it may be briefly stated thus. In the course of development of some animals, man, for instance, the embryo passes through stages similar, and in many respects,

identical with similar embryonic stages of other animals. The points specially enumerated under this head may be grouped as follows:—The original developmental stages of the human ovum agree with those of every other mammalian ovum; the embryo possesses branchial clefts, aortic, or branchial arches, a thymus body, a notochord, corpora wolffiana; the later stages show a rudimental covering of hair over the entire body, whose direction exactly corresponds with the arrangement of the hairs of the primates (Eschricht, Ueber die Richtung der Haare, &c.— Muller's Archiv., 1837, p. 47); a great toe farther separable from the others than in the adult (Wyman, Proc. Boston Soc. Nat. Hist., 1863, p. 185); a rudimental left superior vena cava; brain convolutions, similar to those of the baboon (Bischoff, Die Grosshirnwindungen des Menschen, 1868, p. 95).

Now of these embryonic characters, tabulated in the above list, there is not one which can be accounted for on teleological grounds. Other embryonic arrangements there are which perform obvious functions; but, of these, not one can be said to discharge any necessary part in the economy of foetal life, but all are related, apparently at least, to the perfect forms of other animals.

In concluding this review of the first part of our subject, we cannot deny that the defenders of evolution have the best of the evidence on their side. Man's body in embryonic stages is indistinguishable from the embryos of other animals, still later possesses such positive character of affinity as the hairy covering, occasionally exhibits specially quadramanous features, and always presents useless rudiments of structures, which are fully developed in other forms of living beings. The force of this combined argument is undoubtedly great, and, in the present light of science, unanswerable.

The argument *quo-ad* time is, however, very weak in the hands of Mr. Darwin, and, when we come to inquire, what evidence have we of the links joining on the *proto-homo* to the *proto-pithecus* on the one side, and to the *homo* on the other, we are answered with such replies as—the geological record is imperfect; we know little of the tertiary geology of the cradle of the human race, &c., &c. Certainly these are undoubtedly true, but it is very negative evidence in support of the theory. Mr. Darwin makes the most of M. Gaudry's Dryopithecus as a connecting link between the two sub-families of catarrhine monkeys, the macacus, and semno-pithecus; but this all goes for nothing as positive proof, until the

proto-homo be found. Certainly we have no trace of him in the Neanderthal, Eguisheim, Crespy, or Engis skulls; though some of these may be of low type, yet they are decidedly human, and the missing links have yet to be found. And of those races, which are only known to us by their works, the palæolithic and neolithic men, these tools, designs, &c., which remain, show they were truly men, as there are no evidences whatever of similar works of an undoubtedly pithecoid origin.

II.—We have just seen that the evolutionists hold a very strong, if not an unassailable, position in their arguments regarding the human corporeal frame. We now turn to the second part of our study to see whether man's psychical nature bears as easy interpretation on the development theory as his physical nature ; and here we find that there is a tendency in the defenders of the evolution philosophy to rely upon the (at least temporary) firmness of their first position, and by force of ingenuity to bear down all opposition. This is favoured by the obscurity often attendant on the interpretation of psychological phenomena. The great strong-hold of the evolutionists, and of Mr. Darwin in particular, is the comparison of the psychical phenomena of highly educated brutes with those of man in his savage state, and the establishment thus of intermediate gradations. Any one who reads the reports of travellers regarding the latter must know how precarious argu-ments drawn from these must be in general. A careless traveller, perhaps prejudiced one way or the other, passes through the territory of a tribe. Imperfectly acquainted with their language, he gives his own interpretation of what he sees and hears, and presents this as a correct picture of savage life. In these days, when travelling even in savage lands is common, when every traveller must write a book and state, *ex cathedra*, that such and such are the opinions of such tribes, it cannot but be expected that we can get travellers' opinions in favour of any possible theory. With this protest, *in limine*, against a part of Mr. Darwin's method, we will proceed to notice the arguments used by the upholders of pure evolution.

Mr. Herbert Spencer states that there is no difference between the rationality of man and that of animals, and points to the example of an infant, who is in intelligence no higher than a dog. Mr. Darwin[a] extends this by showing the mode of growth of

Descent of Man, p. 11.

human morality and rationality, in which he says there are four stages:—1st, the evolution of the social instincts, producing a sense of pleasure in the society of fellow-creatures ; 2ndly, memory shows that this pleasure is destroyed by indulgences in ungoverned passion ; 3rdly, after animals have acquired language, public opinion becomes the guide in the community ; and 4thly, virtuous actions thus developed become habits, and these habits are to an extent hereditary.

Now to establish this theory we require to find data upon which to reason, similar in kind to those necessary in establishing the evolution of the physical frame of an animal. We require to find gradations in the manifestations and qualities possessed by the ψυχή of man and animals to find traces of a rudimental or lower soul-form in primitive man, and to see traces of its similar gradual development in the lines of animal descent parallel to that of man's.

The instances adduced by Mr. Darwin as examples of the early steps of psychical development in lower animals are—1st, the posting of sentinels by gregarious animals ; 2nd, the performing of common services to each other, as monkeys pulling out thorns, &c., from each other ; 3rd, hunting in packs ; and 4th, sympathies, and no stronger cases can be brought from animals in their states of nature. He also instances cases of remarkable intelligence in dogs, horses, &c., in a condition of domestication and education. Now, on analysing these cases, we see that they are all reducible to the effects of affections, memory, simple apprehension, consciousness, fear, the simpler forms of judgment, attention, imagination (as evinced by dreaming). As far as one can see, no other simple principles are manifested in any of the exhibitions of intelligence in lower animals.

Are then the complex phenomena of human psychology of the same kind as these ? Evolution answers yes. The intellect of a Bacon or a Newton, and the fancy of a Shakspeare, are only psychical manifestations depending on a higher degree of the same force as that which animates the worm which preys on their dead bodies. All are of the same kind, and all finally merge into the great sum of force in the universe. And what is the bearing of this theory on the present position and future prospects of humanity ? Man, with all the parts of his complex nature and his high intelligence evolved from lower forms of being, possesses only a life which does not differ more from that of the *amphioxus*

than does that of the *amphioxus* from the vitality of the *pro-tamœba :* the life in all is the same, a common attribute differing only in being displayed in the first in a more complex organization than in the second, and in the second than in the third. No other individuality does any one of these possess than the force of life, the attribute force of the protoplasm of the body, and when the body ceases to show traces of its life, when the protoplasm ceases to be protoplasm, and loses its contractility, when the force of life becomes chemical decomposition, the individuality is irre-coverably lost, and that which was a reasoning man becomes a corrupting mass of matter, and nothing more. The idea of the immortality of the soul is a dream: Hebrew, Platonist, and Chris-tian have been alike pursuing a chimera; these have no hope beyond this life, and, therefore, being self-deceived, are of all men most miserable. This is the picture held up before us by the evolutionist. Disguise it as you may, yet the death's-head and the black mantle of annihilation are its fitting emblems. They may predict a glorious future for the human race when still farther evolved towards perhaps its final apotheosis ; yet for us there is no hope, nothing but annihilation, the transmutation of our bodies into brute matter, and our life into physical force.

But looking from this picture on the living human race, with its energies, hopes, and fears, we are led to question one of the fun-damental portions of this philosophy, and to detect an evident contradiction in the method whereby the manifestations of the present psychical endowments of mankind are accounted for by these theorists. Man, in his every form as we find him in nature now living, displays certain peculiar principles of action which leaven his every-day life. Not merely is he led or driven by his appetites, desires, and affections like the brutes, but he exhibits other grounds of action which we dare affirm can never be attri-buted to even the most intelligent of them—principles the tokens of whose presence characterize alike the civilized man and the savage. Man everywhere has some more or less clear shade of a consciousness of the existence of a distinction between right and wrong. Though his light of intellect may not, nay does not, always lead him to see what is the right, and what the wrong, yet that there is such a distinction mankind as a race universally acknowledge. As to the evolutionists, the admission of this would be perilous. They have ransacked the depths of savage life abroad, and the still lower heathendom of our large cities, to find exception,

but all the so-called exceptions hitherto adduced have shown themselves to be fallacies. All they can show is that in the black night of heathendom nature tells not abstractly what is right, but there is, in every fairly examined instance, some detectible trace of a moral nature, some sign of the recognition of the existence of such a thing as virtue, and the fact remains uncontrovertible that out of the 1,000,000,000 of this world's inhabitants, none dare state that even the thousandth part show no signs of the recognition of a right, the foundation of morality. Those who have lived longest among barbarous tribes are the best judges of this, and their testimony has constantly been that, even in the dark places of the earth, ideas of right and wrong, in some form or other, are known. Such is the testimony of Mr. Wallace among the Malay Islanders, of Mr. Bonwick among the Tasmanians,[a] of Strzelecki among the Australians,[b] of La Billardiere among the same people, of Snow among the Fuegians, of Whymper among the Siberians,[c] of Earl among the Papuans and other races of the Indian Archipelago,[d] of Livingstone and Barth in Africa, of Majors Gray and Laing in West Africa, of Messrs. West and Jones among the Stone and Red River Indians, Krusenstern among the Marquesas Islanders, of Mr. Waddell among the natives of Old Calabar, and very many more might be cited did space permit.

If, in opposition to these, the flippant observations of hasty travellers be quoted, it will be borne in mind that this is a case where well authenticated positive evidence bears down any amount of negative assertion.[e] We may remark here that it is only on the theory of Smith and Bain that Mr. Darwin's position is at all tenable.

Now, in dealing with Mr. Darwin on this point, it is well to notice that a thorough naturalist and man of science has taken the field in opposition to him on this very ethical ground. Mr. Mivart, in his admirable book, enters into this question at length, and sums up in a series of propositions. Mr. Darwin has, following somewhat

[a] Daily Life of the Tasmanians, pp. 12, 58.

[b] New South Wales and Van Diemen's Land, 1845, p. 339.

[c] Alaska, &c., 1868, p. 162.

[d] Native Races of Indian Archipelago, 1853, p. 81.

[e] Instances of such perversion of the moral sense, as the approval of infanticide and other vices, do not necessarily show absence of such a sense, although this is Mr. Darwin's strongest argument. If any tribe exhibit any recognition of the virtue or vice of any courses, it is sufficient as evidence of its existence.

in the footsteps of Protagoras the sophist, described morality
as " the congealed[a] past experience of the race, and virtue as a sort
of retrieving which the thus improved human animal practices by
a perfect and inherited habit, regardless of self-gratification, just
as the brute animal has acquired the habit of seeking prey and
bringing it to his master instead of devouring it himself." Now
Mr. Mivart states—1st. That natural selection could not have
evolved a higher degree of morality than appears to be useful to
the individual. 2nd. That it cannot account for such virtues
as care for the sick and aged, but rather for the lower social
states. 3rd. It could not have evolved from pure utilitarian con-
siderations, systems of abstract virtue, nor could it have produced
such a maxim as *Fiat Justitia ruat cœlum.* 4th. The interval
between material and formal morality is beyond its power to
traverse.

If it be proved, as it may, that a recognition of the principles of
morality is a characteristic of man, then the evolutionists fall back
on what they esteem to be instances of moral distinction in lower
animals; but "it may be safely affirmed that there is no trace in
brutes of any actions simulating morality which are not explicable
by the fear of punishment, the hope of pleasure, or personal affec-
tion," and the connexion between these actions and their motive is
always apparent—not so in man; and the consideration of the last
of Mr. Mivart's propositions is well deserving of the attention
of all.

In such a necessarily limited paper as this it is impossible to go
further in demonstration of the natural existence of a moral sense
in man; but the more carefully the matter is considered, the
stronger will the evidence appear. We have yet to sketch, in a
few words, the outlines of a second great motive which underlies
the actions of all men. Mr. Darwin (p. 65) says "there is no
evidence that man was aboriginally endowed with the ennobling
belief in an omnipotent God." Now, in reference to this, if we
examine the position of the present human race regarding religious
belief, we will find that the remarks made above respecting morality
hold good regarding religion. This is the testimony of many
authors; and if we test the evidence upon which races are pro-
nounced totally irreligious, we will find that it is mainly a want of
abstract religious opinions that is relied on. Even those races

---

[a] Mivart, Genesis of Species, p. 189. See also an admirable article by Mr. Hutton,
Contemporary Review, July, 1871, p. 463.

which possess no form of religion in the abstract, show tokens of religiosity in the concrete, by superstitious belief in the supernatural, evil spirits, witchcraft, charms, &c. This is the case with the Tasmanians,[a] with the hill tribes of India, with the Veddahs of Ceylon,[b] with the Siberians,[c] with the Australians,[d] with the Fuegians,[e] with the races of Africa.[f] In all these cases, although no abstract deity may be acknowledged, there is in their super-stitions a tacit admission of a supernatural power, and this is one of the first stages of religiosity. These witnesses are unwilling in some cases, and therefore more important, and the combined evidence amounts to this, that of not one million in the world can it be predicated that they are free from some religious feeling. Religion in these cases is shown—1, in its simplest form, in the recognition of a supernatural power, evil or good; 2, in the recog-nition of a providence on whom man depends; 3, and to whom man is accountable. This last phase of religion, the acknowledg-ment of duty, presupposes a law of right and wrong, and is shown by such measures of propitiation as sacrifices or offerings. Religious offerings are undoubtedly believed in by more than ninety-nine hundredths of the human race; and how are they accounted for? Why, say the evolutionists, men revered the memory of their ancestors, and came to deify them, and to invoke their favour by gifts. If so, this must arise from a wide-spread belief, even in the rudest times, that death was not annihilation, that one of the very thoughts which has been pronounced unthinkable was actually believed and acted on by an overwhelming majority of the human race. Thus, even on this theory of Mr. Tylor's, mankind, as a race, acted on an intuition of immortality and a consciousness of the existence of unseen beings. But on what evidence can it be proved that man was aboriginally not endowed with a belief in a God? In the old stone and bronze ages we have positively no evidence one way or the other; indeed, until later ages had engrafted symbolism on primitive religious worship, it is very hard to see how any evidence could be preserved. The very earliest intelligible records that we have manifest an existing religion. The remains of some of the earliest sepultures show traces of what as likely

[a] Bonwick, op. cit., p. 178.
[b] Bailey.   [c] Whymper, op. cit., 1866.
[d] Stuart's Central Australia, Vol. ii., 1849.
[e] Snow's Two Years' Cruise off Tierra del Fuego, Vol. i., p. 326, 1857.
[f] Savage Africa, Winwood Reade, 1863, p. 536.

were as were not religious rites; so that we may with perfect safety retort Mr. Darwin's assertion thus:—There is no evidence that man was not aboriginally endowed with the ennobling belief in the existence of an omnipotent God, and tradition and our earliest records speak of the existence of such a belief.

But those that believe in physical evolution state that the elements of religiosity exist in the lower animals, that as Lesley, and after him Braubach, have expressed it, man is the god of the dog; but in this apparent analogy there is no constant similarity of the singulars. The domestic dog's wild relatives and his more distant congener the wolf, though the same specifically, show no such respect to man; and though man has acquired influence over the domesticated races by subjecting them directly to education, it is a superiority of power visibly manifested, and the same principles which we noticed before, fear, memory, affection, &c., mainly serve to keep the dog in subjection. Now, though these enter into some of the forms of fetichisms in the world, yet we cannot limit the feeling of religion to these; there is in them nothing of superstition, nothing of an appreciation of the moral excellence of deity, nothing of an internal, formal virtue, the last two which are necessary elements in developed religion, properly so called.

Nor, as in the case of morality, is the cause assigned by Mr. Tylor and Mr. Darwin adequate to account for a developed religion. A stream cannot rise higher than its source, and the primitive religion produced by the contemplation of nature and its forces, in a rude state of society, could no more have produced the perfectly developed systems of religion to be found on the earth than the " unreasoning intuitions " of the utility of moral actions could have produced a perfect morality. Even if it could be proved that any races of men had no traces of religion or of the recognition of the existence of moral distinctions, this would not be a necessary proof of the original absence of such a belief. The statement that a race having such a belief could never lose it is founded on a hypothesis which, in other matters, is palpably false. Races, the lineal descendants of the great nations of antiquity, still live, and yet how many of the ancient useful and ornamental arts possessed by them are lost. This is a fact so easily proved that it would be unnecessary to waste any more of our space in its discussion.

Man possesses thus these two distinct principles of action, mixed up certainly in their operation with his other and more animal mental principles, but evidently distinct in their nature, and as far

back as the days of Aristotle there was some such distinction recognized. We find that philosopher speaking of the νους which originated without, and different from the ψυχή which originated from the seed itself; and this νους Thales identified with God.[a] Among other ancient writers we find Josephus (*Antiq. Jud.*, Lib. 1, cap. 1, § 2) saying, regarding the Creator, πνευμα ενῆκεν αὐτῷ καιψυχη. Plato describes the soul of man as composed of the ἐπι θυμια, θυμος and νοῦς, the latter of which is the regulative principle τὸ ἡγεμονικόν. And this is the principle which wants its analogue in the lower animals, which possess the two former. And thus Lucretius characterizes it, in speaking of death—

> " Cedit item retro de terrâ quod fuit ante
> In terram; sed quod missum est ex Ætheris oris
> Id rursus cœli fulgentia templa receptant."
>
> (De Rerum Natura, lib. ii., v. 998).

Empedocles taught also the duality of the soul, one part being rational (specially human), and one sentient and perceptive (ψυχῇ), compounded of the four elements.

The same distinction is recognized by more modern metaphysical writers abundantly. " We have to distinguish in the soul two states : the one is that which derives its character from the life and light infused by the Divine Spirit, the other, no less essential, is that which man has by nature, including the understanding, the passions, feelings, and affections" (*Green's Spiritual Philosophy*, 1865, Vol. i., p. 288). The distinction of the soul as thinking, cognition, or idealistic momentum, as discriminated from the combination of sensibility and irritability which make up instinct, was pointed out by Schelling (Chalybäus, Lect. xii.), and from other authors quotations might be adduced *ad nauseam* to show that the opinion of the duality of the human nature is recognized by competent authorities.

Of the two parts of man's psychical nature thus distinguished, one, the seat of the passions, desires, and appetites, is identical with that of the lower animals, and in this part subsists all the feelings which Mr. Darwin relies on to prove the derivative nature of man's rationality ; the other is the part which has no correlate in the lower animals, the seat of the moral sense, and the religious feelings, that which links us to higher created intelligences, which no evolution can account for, to which we find no mere physical force approaching.

[a] Plutarch De Placitis Phil. I., sec. 7.

Of the origin of this we have no other account than that given in revelation. Science, as it shows us no steps approaching to it, cannot bring us nearer to it, and we have no choice but to accept the doctrine that God breathed it into the animal frame of man, already endowed with his physical attributes, or to leave it wholly unaccounted for.

This leads us into, and has a definite bearing on, a curious subject which neither have we space to follow out here, nor would this be a suitable place for its expansion. If this doctrine of mixed evolution be accepted, whether is that specially created part of man's nature a truly special creation in every individual, or is it, after its original formation, transmitted *per traducem* from parent to child, as taught by Tertullian. The pure evolution theory pledges us unconditionally to traduction; the creation theory of the soul does not, but analogically favours the opposite view. The only important ojection ever urged against the latter is that as the human soul is morally imperfect, if it be regarded as a special creation, does not that make the Creator the direct author of sin? but if we regard the Creator as the framer of the entire universe, and all its parts, the origin of evil is quite as mysterious on any other theory. A more valid argument may be brought against the traduction theory; if it were true we would expect to find a well marked heredity in what we must regard as soul characteristics. Now, we find undoubted traces of hereditary transmission of such mental characters as depend on the mere animal nature ($\psi\upsilon\chi\dot{\eta}$) of man, capacities of regulation of appetites, special desires or affections, trains of thought, genius, &c.; but the heredity of principles of unmixed morality, or in matters of unmixed religion, is so far from being recognized, that its non-existence is proverbial.

The subject dealt with in this work is one of so vast extent and of so deep interest, that we have been able only to sketch out in outline a number of considerations, and we have been led to review the whole subject more closely than the book which is our text. Mr. Darwin has as signally failed in his attempts to show the derivability of man's soul from the psyche of the brute as he has succeeded in making for himself a strong position regarding the evolution of the human body. Still, in the present state of science, it behoves every man to be careful in his interpretations of lines of facts, and to content himself with provisional opinions. We have, however, no reason to confound " the spirit of the beast which goeth downward to the earth," to return to its original form

of physical force, with " the spirit of man which is ascending " to
a higher destiny, and fitted

> " to flourish in immortal youth,
> Unhurt amid the war of elements,
> The wreck of matter, and the crash of worlds."

<div align="right">ALEXANDER MACALISTER.</div>

On the Wasting Diseases of Infants and Children. By EUSTACE
    SMITH, M.D., London.   2nd Edition, revised and enlarged.
    London: James Walton.

THIS work is one of real practical value, and will be found to
contain a considerable amount of information of importance to the
practitioner.   Under the denomination of the wasting diseases of
children, Dr. Eustace Smith describes simple atrophy from insuffi-
cient nourishment, chronic diarrhœa, chronic vomiting, rickets,
inherited syphilis, mucous disease, worms, chronic tuberculosis,
chronic pulmonary phthisis, and tuberculization of glands.   There
are also two chapters, one—the introductory—on wasting, and the
final chapter on the diet of children in health and disease.

In his introductory chapter the author dwells with much force
on the diminution of excitability and of vital reaction in children
who have been reduced by malnutrition.   In such patients severe
organic disease may set in almost without symptoms, certainly
without such as adequately reveal the extent and gravity of the
lesion.   Some good remarks on the physical examination of chil-
dren follow, and the author proceeds to the subject of the general
treatment of chronic wasting.   The diet must be carefully regu-
lated so as to suit the requirements of the case.   Frictions with
the hand alone or with oil are very useful, and the author believes
that by means of the oil nourishment is introduced into the system,
while the secretions generally are increased.

We are somewhat sceptical regarding the benefit to be derived
from oil-rubbing in the way of direct nutrition of the body, but of
its value in other respects we have had long experience.   As
regards the use of counter-irritants we are cautioned that a dan-
gerous amount of irritation may be produced in an atrophic child
by an agent which would be harmless where the health is not
reduced.   Baths are, under certain circumstances, of much value.

On the subject of the use of internal remedies in cases of wasting, Dr. Smith urges earnestly that tonics ought not to be administered so long as any derangement of the digestive organs remains uncorrected. On this point we think Dr. Smith goes too far. We have seen on many occasions unmistakable advantage derived from the administration of tonics, while digestive derangement was still far from being completely remedied. In fact, if we act on the principle that tonics are not to given till all digestive disturbances are over, we would in many cases wait too long for the patient's safety, and be precluded from administering them at all. Gastric and intestinal disorder of particular kinds will often be treated successfully by tonics without any other remedy whatever, and in other instances well-chosen medicines will altogether fail in modifying beneficially digestive derangement until tonics are administered in conjunction with them. At the same time it is undoubtedly true that mischief may be done by the injudicious exhibitions of tonics in many forms of digestive disorder at too early a period.

In the chapter on chronic diarrhœa we find the following plan of treatment recommended in obstinate cases:—

" All food must be stopped, and the child must be nourished in the following way. A piece of raw mutton or rump steak, free from gristle or fat, is finely minced, and is pounded in a mortar till it is converted into a pulp. The pulp is then strained through a fine sieve or a piece of muslin, to remove the blood-vessels and cellular tissue. Of the meat so prepared, a teaspoonful is given at regular intervals four times in the day, and every day the quantity administered is gradually increased, until half a pound is taken each day in divided doses. During this treatment *no other food of any kind must be allowed*, and no fluid but thin barley-water, or a drink made by mixing the unboiled whites of three eggs in a pint of water, sweetening it, and flavouring with a little orange-flower water. This diet usually causes the motions to have an intensely offensive smell; but this is of no consequence, and the parents should be warned of its liability to occur. The patients themselves often like this food, and take it eagerly. If, however, as may happen, they show any repugnance to it, the pulp may be sweetened with white sugar, or a little confection of roses may be added to make it more palatable, or it may be given in a small quantity of veal broth. As medicine, we must give at the same time the bismuth and chalk mixture, with the addition of one drop of tinct. opii to each dose."

The administration of raw meat as a remedy in intractable cases

of diarrhœa was proposed by Dr. Weisse, a Russian physician, but was first brought prominently forward by Trousseau. It is of undoubted value in some instances.

The scale of diet in less obstinate cases recommended by Dr. Smith will be found in the Report on Medicine in the May number of this Journal.

Under the title of mucous disease the author describes a malady characterized by an increased secretion of mucous from the alimentary canal which interferes with the digestion and absorption of food. In this disease the child loses flesh, colour, and spirits, and tubercle is often suspected without cause to exist. The appearance of the tongue is peculiar—it has a glossy, slimy look, as if it had been brushed over with a solution of gum, an appearance which is owing to excessive secretion of the glands of the mouth. The fungiform papillæ at the sides of the dorsum are also unusually distinct. The diagnosis of this affection is given as follows:—

" *Diagnosis.*—The symptoms of this derangement present a remarkable resemblance to those of chronic tuberculosis with which it is so often confounded ; the distinguishing points between the two diseases are therefore of much importance.

" The most characteristic symptoms of mucous disease are : the slimy appearance of the tongue ; the large quantities of free mucous in the stools ; the great want of regularity in the progression of the symptoms ; and the periodical occurrence of bilious attacks. If these conditions are observed to follow an attack of whooping-cough, or to occur at the time of the second dentition, if they are accompanied by dry rough skin and sallow complexion, and if the temperature of the body is not raised above the natural level, we may conclude that the illness is due to the cause which has been described.

" With regard to the heat of the body it must be remembered that a continued elevation of temperature is necessary to demonstrate the existence of tuberculosis. In mucous disease the temperature may be elevated temporarily by passing sources of irritation, and thus may be found to be high on two or three successive days. In these cases, therefore, some caution should be exercised in making a diagnosis, and further observations will be necessary before we can feel ourselves justified in giving a positive opinion upon the nature of the disease.

" Cases, however, of this derangement occur in which the temperature rises and remains elevated, perhaps permanently, although the symptoms in other respects corresponds to those of mucous disease. Pneumonia is very apt to attack such patients, and it is not at all uncommon for the deposit, remaining entirely or partially unabsorbed, to undergo cheesy

transformation and form the so-called scrofulous pneumonia ; one of the many varieties of pulmonary phthisis.   In such cases it is often a very nice point to decide upon the presence or absence of grey tubercle, but by careful consideration of the history of the acute attack, and by minute observation of the seat and progress of the physical signs, a diagnosis can be generally arrived at (see diagnosis of pulmonary phthisis).   If the formation of grey tubercle occur at all in such cases, the coincidence must be looked upon as accidental, for mucous disease is quite distinct from the tuberculous diathesis and independent of it."

The final chapter on the diet and treatment of children in health and disease will be found especially useful to the junior practitioner, who is often at a loss in the management of children as regards the food to be administered.   It contains very minute and elaborate directions, and scales of dieting for different ages and conditions.

We are glad to be able to recommend this work as one of sterling merit, and one which we have no doubt will be very favourably received and considered by the profession.

General Surgical Pathology and Therapeutics, in Fifty Lectures ; a Text-Book for Students and Physicians. By THEODOR BILLROTH, Professor of Surgery in Vienna.   Translated from the fourth German edition by CHARLES E. HACKLEY, A.M., M.D. ; Surgeon to the New York Eye and Ear Infirmary ; &c., &c. New York : Appleton and Co.   1871.   Pp. 676.

THIS is a work which we can honestly recommend to our readers as one of the most learned and exhaustive hitherto published in English on the subject of which it treats.   The fact that it has already run through four editions in the native language of its author is in itself sufficient testimony to its merits.

The translator, who has done his part conscientiously and well, observes in his Preface that during the last ten years the microscope has done much to advance our knowledge of pathology ; and in no country so much as in Germany, where the study of pathological anatomy has made the most rapid progress.   In the volume before us Professor Billroth, a noted authority on surgical pathology, has given us a complete *resumé* of the existing state of knowledge on this branch of medical science.

Most of the views found in these lectures have been floating through the journals for some years past, but have never been so fully presented to the profession in any one work before. Besides having passed through four German editions, it has been

translated into French, Italian, Russian, Hungarian, and now into English. It is illustrated by one hundred and fifty-two well-executed woodcuts.

" Almost every time," says the author, " that it has become my pleasant task to go over this book in preparing a new edition, I have thought, this time at least, there will not be much to alter; nevertheless, I have always found much—very much—to improve, to cut out, or to add. In so doing I have always had the satisfaction of knowing, that even in short periods the progress of science had been quite perceptible. We do not notice this much while swimming with the stream, but it becomes very evident when we have before us a book which is to a certain extent a photogram of the state of affairs two years since."

In his first lecture, which is introductory, Prof. Billroth offers some excellent observations on the relation of surgery to internal medicine, in the justice of which we fully concur:—

" We consider it a happy advance that the division of surgery from medicine no longer exists, as it did formerly. The difference between internal medicine and surgery is in fact only apparent; the distinction is artificial, founded though it be on history, and on the large and increasing literature of general medicine. In the course of this work your attention will often be called to the frequency with which surgery must consider the general state of the body, to the analogy between the diseases of the external and internal parts, and to the fact that the whole difference depends on our seeing before us the changes of tissue that occur in surgical diseases, while we have to determine the affections of internal organs from the symptoms. The action of the local disturbances on the body at large must be understood by the surgeon, as well as by any one who pays especial attention to diseases of the internal organs. *In short, the surgeon can only judge safely and correctly of the state of his patient when he is at the same time a physician.* Moreover, the physician who proposes refusing to treat surgical patients, and to attend solely to the treatment of internal diseases, must have some surgical knowledge, or he will make the grossest blunders. Apart from the fact that the country physician does not always have a colleague at hand to whom he can turn over his surgical patients, the life of the patient often depends on the correct and instantaneous recognition of a surgical disease."

The forty-nine lectures which succeed that which is introductory are grouped in twenty chapters or parts.

The first contains eight lectures, and treats of simple incised wounds of soft parts. Chapters II., III., and IV. treat of

punctured wounds and their peculiarities, contusions and contused and lacerated wounds. It is these chapters in which the subject of traumatic inflammation is dealt with, and the author tells us that he has been most careful to revise them in accordance with the recent advances of science. Prof. Billroth's observations on traumatic fever have been already referred to in the pages of this journal; we may be permitted, however, to quote at some length from the pages of the work before us a few passages on this important topic:—

"By the name 'fever' we designate the combination of symptoms which, in a thousand different shapes, almost always accompanies inflammatory diseases, and is generally apparently due to them. We know its duration and course in various diseases; still, its nature is not fully understood, although it is better known than formerly.

"The different fever symptoms appear with very variable intensity. Two of these symptoms are the most constant, viz., the increase of pulse and bodily temperature; we can measure both of them, the first by counting, the latter by the thermometer. The frequency of the heart's beat depends on many things, especially on psychical excitement of all sorts; it shows slight differences in sitting, lying, standing, walking. Hence, there are many things to which we must attend, if we would avoid error. However, we may avoid these mistakes, and for centuries the frequency of the pulse has been used as a measure of fever. Examination of the pulse also shows other things important to be known: the amount of the blood, tension of the arteries, irregularity of the heart-beat, etc.; and it should not be neglected even now that we have other modes of measurement of the fever. This other, and in some respects certainly better, mode of measuring the amount and duration of the fever is determination of the bodily temperature with carefully-prepared thermometers, whose scales are divided, according to *Celsius*, in one hundred degrees, and each degree in ten parts. The introduction of this mode of measurement into practice is due to *Von Bärensprung, Traube,* and *Wunderlich*; it has the advantage of graphically presenting the measurements, which are usually made at 9 A.M. and 5 P.M., as curves, and making them at once easily read.

"A series of observations of fever in the normal course of wounds shows the following points: traumatic fever occasionally begins immediately after an injury, more frequently not till the second, third, or fourth day. The highest temperature attained, although rarely, is 104.5° F.–105.5°; as a rule it does not rise much above 102°–103°. Simple traumatic fever does not usually last over a week; in most cases it only continues from two to five days; in many cases it is entirely

absent, as in most of the small superficial incised wounds of which we spoke above. Traumatic fever depends entirely on the state of the wound; it is generally of a remitting type; the decline may take place rapidly or slowly.

" From these observations we should naturally suppose the fever would be the higher the more severe the injury. If the injury be too insignificant, there is either no fever or the increase of temperature is so slight and evanescent as to escape our modes of measurement. It has been thought that a scale of injuries might be constructed, according to which the fever would last a longer or shorter time, and be more or less intense, in proportion to the length and breadth of the wound.

" This conclusion is only approximately correct, after making very considerable limitations. Some persons become feverish after very slight injuries; others do not, even after severe ones. The cause of this difference in the occurrence of traumatic fever depends partly on whether the wound heals with more or less inflammatory symptoms, partly on unknown influences. We cannot avoid the supposition that purely individual circumstances have some influence : we see that, from similar injuries, one person will be more disposed to fever than another.

" *Febrile reaction* is usually greater from contused than from incised wounds; according to our view, this is because, from the decomposition, which is much more extensive in crushed than in incised parts, far more putrid matter enters the blood. If in any case the putrid matter is particularly intense, or very much of it is taken up (especially in diffuse septic inflammations), the fever assumes the character of so-called *putrid fever ;* the state thus induced is called *septicemia ;* we shall hereafter study it more closely. If the suppurative inflammation extends from the wound, there is a corresponding continued inflammatory or suppurative fever; this has the character of remittent fever with very steep curves and occasional exacerbations, mostly due to the progress of the inflammation, or to circumstances that favour the reabsorption of pus. If we call the fever that often, but not always, accompanies traumatic inflammation, simple *traumatic fever*, we may term the fever that occurs later ' *secondary fever* ' or ' *suppurative fever.* ' This may immediately succeed the traumatic fever, if the traumatic inflammation progresses regularly; but the traumatic fever may have ceased entirely, and the wound be already healing, and when new secondary inflammations, of which we have fully treated, attack the wound, they are accompanied by new suppurative fever; in short, inflammation and fever go parallel. Occasionally, indeed, the fever *appears* to precede the secondary inflammation, but this is probably because the first changes in the wound, which may be only slight, have escaped our observation. At all events, on every accession of fever that we detect, we should at once seek for the new point of inflammation, which may be the cause. I am far from

asserting that it is necessary to measure the temperature in all cases of wounds; undoubtedly any experienced surgeon, accustomed to examine patients, would know the condition of his patient without measuring the temperature, just as an experienced practitioner may diagnose pneumonia without auscultation and percussion; but no one who understands the significance of bodily temperature doubts that its measurement may sometimes be a very important aid to diagnosis and prognosis. It is with it as with every other aid to observation; it is not difficult to detect a dull percussion-sound in the thorax where it should not exist; but the art and science of determining the significance of this dull percussion-sound in any given case must be learned; so, too, with measurement of temperature: for instance, we must learn whether a low temperature in any given case be of good or bad omen. I shall enter into more detail on this subject in the clinic.

" Experience teaches that secondary fever is often more intense than primary traumatic fever. While it is most rare for the latter to begin with a chill (a slight chilliness after great loss of blood and severe concussion is not usually accompanied by high temperature), it is not at all so for a secondary fever to commence with severe ' chill.' We shall at once study this peculiar phenomenon more attentively. Formerly the chill was always regarded as essentially dependent on blood-poisoning; if we now regard fever generally as due to intoxication, we must seek some special cause for the chill. Observation shows that the chill, which is always followed by fever and sweating, is always accompanied by rapid elevation of temperature. If we thermometrically examine the temperature of the blood of a patient with chill, we find it high and rapidly increasing, while the skin feels cool; the blood is driven from the cutaneous vessels to the internal organs. As already remarked, *Traube* considers this as the cause of the abnormal febrile elevation of temperature. We shall not discuss this at present; at all events, there is so great a difference between the air and the bodily temperature that the patient feels chilled. If we uncover a patient with fever, who lies wrapped up in bed and does not feel chilly, he at once begins to shiver. Man has a sort of conscious feeling for the state of equilibrium in which his bodily temperature stands to the surrounding air; if the latter be rapidly warmed, he at once feels warmer, if it be rapidly cooled, he at once feels cool, chilly. This trivial fact leads us to another observation. This sensitiveness for warm and cold, this conscious feeling of change of temperature, varies with the individual; it may also be increased or blunted by the mode of life; some persons are always warm, others ever too cold, while for others the temperature of the air is comparatively a matter of indifference. The nervous system has much to do with this. Accurate studies of *Traube* and *Jochmann* have in fact shown that the nervous excitability of an individual has a great effect as to whether, in

a rapid elevation of temperature of the blood, the change will be much perceived or not; hence that in torpid persons, in comatose conditions, chills do not so readily occur with fever, as they do in irritable persons already debilitated by long illness. I can only confirm this from my own observation. Although I have a general idea that, where there is sufficient irritability, rapid elevation of temperature and chill chiefly occur when a quantity of pyrogenous material enters the blood at once, still I cannot deny that the quality of the material is also important. We know nothing of this quality chemically, but we may conclude that it has varieties, because both the fever-symptoms and their duration often vary greatly, and that this does not solely depend on the peculiarities of the patient. According to my observations, in man reabsorption of pus and recent products of inflammation is more apt to induce chills than is absorption of putrid matter, which is perhaps more poisonous and dangerous. I do not wish to weary you with too many of these considerations, and so shall return to the subject in the section on general accidental traumatic and inflammatory diseases, which you may regard as a continuation of this study of fever. I will only remark here that both the septic and purulent primary and secondary inflammations, with their accompanying fever, may also occur from incised wounds, especially after extensive operations (as amputations and resections). We have considered this condition along with contused wounds, because it complicates them much more frequently than it does ordinary incised wounds."

Professor Billroth accepts, almost without modification, the views of Cohnheim regarding inflammation and suppuration. Those of our readers who are acquainted with the admirable reports laid before the Royal Irish Academy lately by Dr. John M. Purser on this subject, will know that other observers have not accepted without challenge the ideas of Cohnheim, who believes that he has established the following propositions:—1st, That in an inflamed part the white corpuscles of the blood pass through the walls of the vessels in great numbers, and having become free in the tissue constitute the cells of pus. 2ndly, That the cells of the inflamed part itself have no share in the formation of pus.

On the first of these propositions the observations of Dr. Purser, which have been made with great labour and care, are quite in accordance with those of Cohnheim: the independent testimony of many trustworthy observers now leave little room for doubt on this point.

With regard, however, to the second proposition (which would, in truth, if established, completely modify all the teachings of

Virchow), there is by no means a like unanimity of opinion. Dr. Purser, after thorough investigation of the subject, reports against it:—" It will be seen," he says, " from the foregoing observations that the main points on which Cohnheim relies in support of his theory must be given up, and that in an inflamed cornea the stellate cells do not remain unchanged or merely degenerate, but that they undergo changes of an active kind, terminating in their multiplication and division into pus corpuscles." Stricker and others corroborate this statement. We must therefore ask our readers to bear this in mind when perusing the passage in Professor Billroth's work devoted to this interesting topic:—

" We must now attend to the question, Whence come the innumerable wandering cells that infiltrate all inflamed tissues immediately after their irritation, as they here do the flaps of the wound? Of late, this question has received the following wonderful explanation, which ten years ago would have been considered as the fancy of a madman: *Cohnheim* made the following remarkable observation : he introduced finely-powdered analin blue into the lymph-sac in the back of a frog, then irritated the animal's cornea with caustic, and found that numbers of wandering cells (lymph-pus cells) containing anilin gradually collected at the cauterized point ; hence the conclusion, *at an irritated point white-blood corpuscles wander from the vessels into the tissue ; these white-blood corpuscles constitute the inflammatory cellular infiltration.* *Cohnheim* then confirmed, by direct observation on the mesentery of a living frog, the discovery already made by *Stricker* on the nictitating membrane that had just been removed, that under some circumstances the white-blood cells wander through the walls of the vessels into the tissues, and showed also that this occurred to a still greater extent in dilated capillaries and veins.

" Although it was afterward shown that an English experimenter, *Aug. Waller,* had several years previously made similar observations on the mesentery of the toad and the frog's tongue, the words of the German observers, *Stricker, Von Recklinghausen,* and *Cohnheim,* were quite independent of his, and *Cohnheim* has the undivided honour of having correctly interpreted his observations on inflammation, which have constantly advanced to the present time, and of having presented them in a form to greatly affect all modern pathology.

" It is difficult for you, gentlemen, to imagine the immense impression made on all histology by these new discoveries, which I have just imparted to you as simple facts, because you are not acquainted with the former point of view from which the origin of inflammatory new formations, and that of complicated organized growths, was regarded. From previous observation, our idea of the affair was about as follows : It was

supposed that the cells of the connective tissue, of which only one variety, the fixed, was known, increased greatly by division as a result of irritation, and cellular infiltration thus resulted. Imagine yourselves back a few years in a time when nothing was known of the vital peculiarities of young cells, of their amœboid and locomotor action, and we only knew how to deduce the course of the pathological process, from various stages of the diseased, but not dead tissues, as is still the case in the normally-developing layer; then you will readily understand that it was decided without hesitation that the cells lying packed together in the inflamed tissue were formed out of one another. Even this was a great advance, which was only possible after the overthrow of the *generatio æquivoca ;* for, not long before, the development of cells and tissue from lymph, coagulated blood, and fibrine, was firmly believed in. The first observation on cell-division as a result of abnormal irritation were made on cartilage by *Redfern* in England; then followed the observations of *Virchow* and *Heis* on inflamed cornea. In both cases it was seen that after cauterization with nitrate of silver, or after introduction of a seton, the tissue was filled with young cells; in the original tissue-cells, biscuit-shaped, then double nucleii were seen, from which a division was decided on; young cells were seen grouped together, and their origin from the tissue-cells seemed indubitable. Hence arose the idea that inflammation was a process in the tissues, which, entirely independent of the vessels, was associated with a rapid luxuriant proliferation of tissue-cells, and partial softening and disintegration of the intercellular tissue. *Von Recklinghausen's* discovery of the two varieties of cells found in connective tissue, as well as his discovery of the varied movements of pus-cells, might well have given rise to the question whether the proliferation of the cells, on irritating the tissue, started from the fixed or movable connective-tissue corpuscles, but failed to do so. But now observation is piled on observation; and we are driven to the supposition *that all young cells which in inflammation we find abnormally in the tissue are wandering white-blood cells.*

" Of course, from the various errors to which we are liable in interpreting the significance of what has been observed, we should be very careful about announcing general principles. The feeling that we may again overshoot the mark, involuntarily steals over every one who of late enters on observations in pathological histology. But, whenever it has been possible to examine living tissue for a length of time, it has appeared that the fixed connective-tissue cells undergo no division; that, in fact, they scarcely change at all, and that consequently the appearances observed on dead inflamed tissue must be otherwise interpreted. In cartilage alone nothing has been observed different from former appearances. As the hyaline cartilage substance has no canals passable for cells, so far as we at present know, there is little left except to suppose

that the increase of cells in the cartilage cavities after irritation results from division of the protoplasm of the cartilage cells; of this I shall hereafter show you preparations; still hyaline cartilage has never yet been watched for days in a living and irritated state, and consequently this observation must give place to the studies on living connective tissue.

"If there be no longer any doubt that all young cells that infiltrate the inflamed tissue, and sometimes, as we shall hereafter see, escape from it in the shape of pus, are white-blood corpuscles, or, briefly, *wandering cells,* we have two questions to answer, namely, *Why* do so many cells wander into the inflamed tissue, and how comes these numbers of wandering cells in the blood; where do they originate? There are two chief opinions regarding the passage of the wandering cells through the walls of the vessels: some believe that they pass at the points where the cells forming the capillary walls separate, that is, through fine openings formed for them; others think that the capillary walls consist of a soft protoplasm, through which the wandering cells thrust themselves. There is also some doubt whether the passage of the wandering cells is to be regarded as due to their own act or as the result of intravascular pressure. It would lead me too far to discuss fully the *pros* and *cons* of this question. My own view, subject to future observations, is as follows: the first change that we see in irritated living tissue is dilatation of the vessels; the immediate result of this is retardation of the flow of blood, increased transudation and a collection of white-blood cells in the periphery of the calibre of the vessels; the wall of the vessel gradually grows softer, possibly from the long contact with the white-blood cells, which gradually enter and finally pass through the wall. Retardation of the circulation, and softening of the wall of the vessel, appear to me the necessary requirements for the extensive wandering of the cells. Whence come the quantities of white-blood cells that escape during inflammation, is a physiological question, and must be answered by the physiologists. Lymphatic glands and the spleen are the organs to which we first turn as the source. Although it cannot be regarded as absolutely proved that, with the extensive escape of cells, new lymph-cells are also formed extensively, still this is very probable; and, as we know from clinical experience that the lymphatic glands near the seat of an inflammation are almost always swollen, it is most natural to assume these as the source of the abnormal quantity of wandering cells. In spite of most zealous efforts, I have been unable to discover any thing about the morphological changes in this cell-formation."

The chapters of Professor Billroth's work devoted to fractures, injuries and inflammation of joints, tumours, &c., are concise and eminently practical as well as scientific. Indeed we have met

with few works in which the science and practice of surgery are more happily combined. The surgical pathologist does not slight the therapeutics of surgery, and, throughout, the importance of accurate diagnosis and clinical observation are dwelt upon. The following passage on the treatment of ganglion illustrates the manner in which the author at once alludes to methods of treatment, and records his own experience:—

"In the *treatment*, we must, above all, bear in mind that we should avoid any operation that might induce suppurative inflammation of the sheath of the tendon, and might disable for a long time or possibly cause a stiff hand in a patient who had been but little inconvenienced by his ganglion. Remedies, such as mercury and iodine, which so stimulate reabsorption in cases of acute or subacute inflammation, are of little use here. The simplest and their most frequent operation is *rupture of the ganglion*. If, as is customary, the ganglion be on the dorsal surface of the hand, we take the flexed hand of the patient before us, place the two thumbs close together on the ganglion, and make strong pressure; this sometimes ruptures the sac, the fluid is effused into the subcutaneous tissue, and then readily reabsorbed. When this method succeeds readily, there is not much objection to it, except that it does not always cause a radical cure. The small subcutaneous opening of the sac soon closes, the fluid collects again, and the disease continues as before. If we cannot rupture the sac with the thumbs, it has been recommended to do so with a quick blow by a broad hammer; although this succeeds now and then, I would not recommend it to you, for if unskilfully done it may cause a severe contusion, whose consequences we cannot always master. When the sac is too thick to rupture with the finger, I employ *subcutaneous discision*; I pass a narrow, short, curve-pointed knife (*Dieffenbach's* tenotome) horizontally into the sac, and with the point of the knife make numerous incisions on the inner wall of the sac; I then draw the knife slowly out, meantime pressing the fluid out of the sac. I then at once apply a compress, envelop the hand and forearm in a wet bandage, to prevent any extensive motion, and have the forearm carried in a sling four or five days. Then the bandage is removed, the small opening is healed, and the ganglion does not usually return, as it is apt to do after simple evacuation. The entire hernial sac has often been entirely removed, sometimes successfully without subsequent inflammation, but at other times with suppuration of the sheath or loss of motion of the finger, so that I do not recommend this proceeding to you.

"The treatment of extensive dropsies of the sheaths of tendons in the palm of the hand and forearm is much more difficult, since, for various reasons, subcutaneous discision is not available here, and resorbents are

of little use; the only thing left is to try other methods, which often at least induce some suppuration. Take into consideration then whether it be really necessary to do any thing severe. If the disturbance be not so decided as to greatly interfere with the patient's business, you had better leave things alone. But, if something must be done, your choice is almost limited to two methods, viz.: an extensive incision and punction, with subsequent injection of iodine. When you make the punction, which I prefer to incision, you should choose a trocar of medium size, as the fibrinous bodies will not escape through a very fine one. You will often have trouble in evacuating them even through a large canula; then you will facilitate the operation by injecting tepid water through the canula from time to time, so that the increased amount of fluid will aid the escape of the slippery fibrine-kernels. As already mentioned, the quantity evacuated is often large. I once took one and a half tumblerful from a tendon sac. After all has been removed, fill a syringe with an ounce of a mixture of equal parts of water and tincture of iodine, or a corresponding quantity of solution of iodine and iodide of potassium, and inject it slowly. Let it remain in the sac one to two minutes, and then escape slowly. Now remove the canula, cover the wound with a small compress, bind up the hand and forearm carefully, and put it on a splint. The patient should stay in bed several days. The operation is followed by a considerable swelling, due to collection of fluid as a result of acute inflammation of the serous sac. If the tension become decided, we should remove the dressings, carefully close the puncture with plaster, then paint the swelling with strong tincture of iodine. In the more favourable cases, the swelling will then gradually subside, become less painful, and in the course of two to three weeks disappear entirely. In many other cases, however, there will be some, even if very temporary, suppuration, which may be checked and subdued with ice. In the worst cases there may be extensive suppuration of the sheath with necrosis of the tendon, and its results. Of course, opening the whole sac naturally induces suppuration.

"On this occasion I must again repeat that there may be hernial protrusions from the capsule of the joint, just as from the sheaths of the tendons, which may become dropsical without the dropsy extending to the entire synovial membrane. The fibres of the capsule separate, and the synovial membrane passes between them into the subcutaneous tissue in form of the finger of a glove. Although such formations of round, pedunculated, long, wreath-like, and other shapes may develop from any joint, they are chiefly met in the knee, hand, and elbow; in the latter I have often seen these isolated dropsies of hernias of the synovial sac communicating with the joint; they are accompanied by slight stiffness of the joint.

" I urgently warn you against operation on these ganglia of the joints; this operation may be followed by suppuration of the joint."

The concluding Chapter (XX.) is devoted to the subject of tumours, and consists of seven lectures, in no respect inferior to the earlier portions of the work.   The author tolerably closely adopts the nomenclature of Virchow, used by this latter author in his already classical work on tumours: he regards as *homologous* or *homœoplastic* growths those which are analogous to the matrix or mother tissue, in which their development takes place; *hetero-logous* or *heteroplastic* formations he does not regard as being of necessity malignant, but merely as formations developed in a matrix of tissue different from that of the new growth (that is to say, heterologous to the matrix) as cartilage in the testicle, epidermis in the brain, &c.   Obviously in accordance with his views in connexion with inflammation, Professor Billroth conceives it to be probable that *wandering cells* escaping from the vessels very materially aid in the formation of tumours, at least in the formation of tumours of the connective tissue series.

But our space does not permit us to enter at length into this subject; we must, therefore, conclude by repeating our opinion of the merits of this work, and thanking Dr. Hackley, the translator, for having placed these lectures within the reach of English readers in so admirable a form.

Lectures on Surgery.   By JAMES SPENCE, F.R.S.E.; Surgeon to the Queen in Scotland; Professor of Surgery in the University of Edinburgh, &c., &c.   Vols. III. and IV.   Edinburgh.   1871.

THE volumes before us are full of interest to the practical surgeon, as they are the statement of the opinions and practice of the author, founded on the fullest experience both as an hospital surgeon and lecturer on surgery.

The author has devoted the present volumes to the consideration of the important subjects in which, from various circumstances, he has had an exceptionally large experience; and this selection has, we think, greatly enhanced the value of the work, as a help both to the student and practitioner in dealing with special difficulties in surgical practice.

On no subject treated of in the present volumes do we find more

valuable information than on the treatment of laryngitis, and more particularly of croup.

" During (says Mr. Spence) the earlier stages of laryngitis in adults and of croup in children, a good deal can be done by active medical treatment to avert or postpone these misfortunes. . . . An excellent plan of treatment is to steam the room or bed, to keep sponges wrung out of hot water constantly applied over the larynx, administering internally at the same time full doses of ipecacuanha wine, so as to keep up a degree of constant nausea."

In his remarks on the after-treatment of croup the following opinion is expressed by Mr. Spence as to the comparative merits of the two great remedies in the disease—tartarized antimony and ipecacuanha; and it is clear from the above quoted passage that it applies to the use of the remedies in the early treatment of the disease as well.

" Under no circumstances would I now resort to antimony, for its effects are most dangerous in diminishing the expulsive power, depressing the patient, and inducing sinking. I am glad that my opinion on this head is strengthened by the high authority and great experience of M. Trousseau. In all respects I find ipecacuanha answer better, either as an emetic or expectorant, without depressing or leading to dysenteric purging, whilst it induces moderate diaphoresis, and allays the febrile condition.

These reasons and the weight of Mr. Spence's opinion, so strongly expressed, are sufficient to shake our faith in tartarized antimony, the remedy more commonly relied on in this country.

If the medical treatment fairly tried fails to procure relief, Mr. Spence recommends the immediate performance of tracheotomy in the laryngitis of the adult and in croup. He says—

" In laryngitis we have no hesitation in operating, because the disease is limited, and has no tendency to spread downwards. Whatever may be said about the propriety of performing tracheotomy in croup, no difference of opinion exists as to the necessity for operation in the laryngitis of adults. In croup, on the contrary, there are conditions which have given rise to a difference of opinion. There is here, as already remarked, a tendency in the diseased condition to spread downwards, and we are therefore told that it is not disease of the larynx, but cynanche trachealis. Now this is just a case where the name of the disease influences its treatment. Cynanche trachealis is a name chosen

as a sort of distinction between croup and the laryngitis of adults, from the tendency to the formation of a false membrane in croup as opposed to laryngitis; but it does not follow from this that the disease is not originally a disease of the larynx. I am quite convinced, from what I have seen of this disease, that it really commences in all cases in the larynx, and I have no hesitation in saying this, whatever tendency there may be for the disease to spread downwards from the larynx. The symptoms point to the larynx being affected from the very first. The symptoms of laryngitis and of croup are exactly the same; there is the same suffocating cough, the same difficult respiration, the same tenderness over the larynx; and all the symptoms point to the larynx being affected from the very first. I feel convinced that, in many cases of croup, the disease is more confined to the larynx than is generally supposed, and that, when it spreads, it does so from the larynx downwards, and does not attack the mucous membrane of the trachea simultaneously with that of the larynx, or, as some would have us believe, attack the trachea and bronchial mucous surface before affecting the larynx. *Post-mortem* examinations reveal to us the complicated disease, not its progress; our knowledge of that must be derived from observation of phenomena during life. Now, to say nothing of the ordinary progress of the symptoms, the immediate relief afforded by the operation in all my cases, even in those which subsequently terminated fatally, shows conclusively that, even in the fatal cases, no disease of the lower part of the trachea could have existed at the time, otherwise the operation could not have afforded the relief it did. As to the presence of bronchitis being a contra-indication to the performance of the operation, a point which I was inclined to insist on formerly, though I would not go so far as some continental surgeons, who consider it absolutely favourable, I must modify my former opinion, inasmuch as in most of the successful cases it was present, and when the tube was properly managed the mucous was easily expectorated. Perhaps it may be considered favourable in one sense, as indicating a condition of the mucous membrane less disposed to the formation of plastic erudations. As regards the propriety of performing tracheotomy in extreme cases of croup, I have operated now ninety-one times in simple and diphtheritic croup, and my present average is one life saved out of three cases, which is a large average in such a disease, and I therefore feel that the operation is perfectly warrantable, and ought to be performed, as it gives the patient his only chance of life.

Mr. Spence has operated about forty times in diphtheritic croup, with slightly more favourable results than in simple croup, still he does not think that these are such favourable cases for the

operation as those of simple croup. He considers the following the indications for determining the propriety of operation in this disease, one happily comparatively rare in this country :—

" First, then, the great and positive indication for operation is the immediate urgency of the suffocative symptoms. When these are intense, and the contracted state of the thoracic parietes shows that little air is entering the chest, the operation is warranted, as affording the only chance of obviating impending death from asphyxia; and this, the only chance, may be given, however unfavourable the prognosis as to the ultimate success. The results of the successful cases point to the fact that the more favourable cases for operation are those in which the laryngeal symptoms have commenced early and progressed rapidly, with perhaps decided local diphtheritic symptoms, but the febrile or constitutional symptoms less prominent—where, in fact, there is least intensity of the constitutional poison, and where the very acuteness of the local symptoms indicates a certain amount of power.

" The cases less suited for operation are those in which the constitutional morbid conditions have existed in a marked form, together with fever, quick and weak pulse, for some time before the exudation affected the air-passages, and in which the croupous dyspnœa is not very intense. Occasional paroxysms of convulsive cough occurring in such cases, and relieved by the ejection of mucous and false membrane, unless increasing in frequency, do not warrant the operation—nor is it warranted in cases where, to speak generally, the colour of the face and lip and the state of the chest show no continued obstacle to respiration. Cases in which the diphtheritic affection has supervened on scarlatina, measles, or gastric fever, or in which there is marked submaxillary swelling, are very unfavourable."

The last group the author would not absolutely exclude from the benefit of the temporary relief and chance of life afforded by tracheotomy.

Cases of slowly progressive disease in which difficulty of swallowing exists are likewise unfavourable.

" Lastly, in regard to early operation as promising greater success, whatever the greater chances may be in ordinary croup (says Mr. Spence), I can see no grounds on which we can hope for its being useful in diphtheria."

On many subjects, besides this from which we have quoted so much, will our readers find equally important information, based on quite as extended practical knowledge—on the subjects of hernia

and the capital operations of surgery. We have selected the
subject of laryngeal disease on account of the comparatively super-
ficial examination of the question discussed by Mr. Spence in the
general text books of surgery, and on account of the importance of
the numerical data furnished by him as a guide for the formation
of a correct opinion. The illustrations of the work are many of
them graphic and excellent, but we must except those of surgical
anatomy, which, in our opinion, disfigure it. In the present day
good illustrations of anatomy are cheap and plenty, therefore there
is no excuse for the publication of such daubs.

A System of Surgery—Theoretical and Practical, in Treatises,
    by various Authors. Edited by T. HOLMES, M.A., Cantab.
    Second Edition. Vol. V. London. 1871.

THIS volume of Holmes's surgery completes the new edition, the
previous volumes of which we have noticed from time to time as
they appeared. The entire work forms a most complete text-
book of surgery, and will be found equally valuable as a guide to
the student and as a book of reference for the practising surgeon.
The ample references to special authorities on each subject con-
tained in the foot notes form an excellent bibliographical index.
We have looked forward with much interest to this volume, as
the author of the article on inflammation, published in the com-
mencement of the work, postponed the discussion of the modern
microscopic investigations on the subject to this the final volume.
Dr. Saunderson has undertaken this subject instead of Mr.
Simon, and has given a very clear account of these observations,
as well as an historical sketch of the progress of this branch of
physiology.

    He holds the opinion, that in the present position of pathology
the methods which in times past have been employed with such
signal success in this country are exhausted. He attributes this
failure in progress to our want of pathological institutes such as
those of Berlin and Vienna.

    No doubt there is much truth in this observation, for without
such institutions training cannot be afforded to students or teachers
in the branches of anatomical study requisite for such researches.

    The phenomena which form the starting point of these

observations are those exhibited by the colourless blood corpuscles and other similar structures when observed during life. These bodies in the blood-stream, in the minute vessels, occupy, especially during the existence of any inflammatory action, a lateral position, manifesting a disposition to adhere to the walls of the vessels. The observation of this fact, which has been long known, is attributed by Dr. Saunderson to Dr. Williams. In 1846, Dr. Waller observed that these bodies in some instances possessed the power of passing through the walls of the vessels into the tissues external to them. This observation fell into oblivion until late years, when it again became the subject of Cohnheim's observation. At the same time extended observation had been made of the power of independent movement which these bodies possess in common with many other animal and vegetable bodies, the so-called amæloid movements. Cohnheim's observations further led him to conclude that pus corpuscles originate in the early stages at least of inflammatory action from colourless blood corpuscles which pass through the vessels into the surrounding tissues. With reference to the facts of the particular position in the blood-stream and the escape of the colourless corpuscles through the vessels, Dr. Saunderson makes the following statement :—

" As yet we are as little able to explain the one as the other. There can, I think, be little doubt that of the two stages in the process of emigration—viz., the long known loitering of the leucocytes along the sides of the vessels, and the newly-discovered penetration by them of the vascular walls—the first is the essential one, and that whenever an explanation is found of the former, it will serve as a key to the comprehension of the latter."

The teachings of the highest authorities up to a very recent time opposed the idea of the permeability of the walls of the vessels by any matters except the fluid elements of the blood. These opinions were formed and maintained especially in reference to the penetration of the vessels from without by corpuscles or any solid matter, particularly pus globules, the penetration of which into the vascular system has so often been held to be the origin of pyæmia.

Dr. Saunderson draws the following conclusions from these observations :—

1. In every inflammation which attains its full development the changes which manifest themselves in the inflamed part are of

three kinds, distinguished from each other according to the organs which are concerned in their production. They are either (1)—effects of disorder of the vascular nerves and centre; (2)—effects of alteration of the properties of the living walls of the capillaries; or, (3)—effects of the stimulation of the living cells by transudation of liquor sanguinis.

2. Of these three orders of phenomena the second only can be regarded as absolutely essential to the existence of inflammation, which may, therefore, in the strictest sense, be said to have its seat in and about the veins and capillaries, it being there that the earliest and most constant effects of irritation or injury manifest themselves.

3. The nervous and vascular effects of local irritation cannot be directly described as successive stages of one process; for the determination of blood to the seat of injury, which is the sole result, and, if I may so speak, purpose of the vaso-motor disturbance, has no relation to the vascular changes, excepting in so far as it tends to make the exudation more abundant. Exudation of liquor sanguinis, although favoured by increased arterial afflux, may occur without it, and as a rule continues after the afflux has ceased. The vascular and textural changes, on the contrary, may be regarded as successive stages of one process, for they are connected by a causal relation—the exudation of liquor sanguinis, in which the former ends, being the determining cause of the latter.

4. The mode in which an inquiry changes the living substance of the vascular walls, so as to make them permeable to the blood, is unknown. The nature of the change itself is also unknown, the only clue which we have to its character being that afforded by the structural alterations to which it leads in certain organs, and particularly by those which are observed when the process of reparation, attended with the formation of new capillaries, is commencing. From these appearances we are led to infer that the primary change consists in the transition of the material from the formed to the plastic condition; from a state in which it is resistant, because inactive, to one in which it is more living, and therefore more labile.

5. In all living tissues the effect of inflammation manifests itself in a modification of the action and properties of individual cells. In cells which form part of permanent structures, the protoplasm increases in quantities, and becomes more or less contractile. Subsequently it is converted entirely or partly into young cells, either by cleavage or by endogenous germination.

The Rapid Cure of Aneurism by Pressure.   By Wm. Murray,
     M.D., M.R.C.P., Lond.   Newcastle-on-Tyne.

The fact of a cure by direct treatment having been accomplished
in a case of aneurism of the abdominal aorta can be no longer
doubted.

Dr. Wm. Murray's case of abdominal aneurism cured by pressure,
which was published in the Medico-Chirurgical Transactions for
1864, wanted one thing to complete it—namely, the account of the
dissection of the tumour, and we now possess this account.   In his
preface to the brief history of the case and of its termination, Dr.
Murray says:—

"The extreme importance of developing a plan of treatment which
shall reach the aneurisms of large and internal vessels, and the equal
importance of rendering that treatment short, safe, and endurable by the
patient, prompt me to bring the subject before the profession, in the
expectation that the treatment herein described will ere long be adopted
in all appropriate cases."

Of the importance of the case as establishing the fact that an
aneurism, even of the aorta, is, under certain circumstances,
curable, there can be no question.   We can only regret that the
more common forms of aneurism of the abdominal aorta are, from
their position, incapable of being made subject to this treatment.

In the case before us, the seat of the tumour was the lower
segment of the abdominal aorta, from which the inferior mesenteric
artery springs, and the tumour did not involve the origins of the
cœliac axis or superior mesenteric vessels at all, as the more
common form of the disease is prone to do—a moment's considera-
tion shows that in such cases as Dr. Murray's only can pressure be
applied to the artery on the cardiac side.   This limitation of the
application of the treatment detracts nothing from its merit when
the nature of the case admits of its application.   Dr. Murray
holds that his case establishes the following propositions:—

1st. The possibility of suddenly blocking up the aorta below
the renal arteries, without injury to the patient.

2nd. It reveals the channels by which blood finds its way to the
lower part of the body, when the aorta is thus occluded.

3rd. It shows the vast importance of giving chloroform in using
pressure for the cure of aneurism; and

4th. It proves that aneurism can be cured in a few hours by

coagulation of blood, while the old method, which cured the disease by fibrous lamination, lasted, on an average, five-and-twenty days.

The history of the case is briefly this:—A thin spare man, a paviour by trade, aged twenty-six, had suffered from symptoms of abdominal aneurism for eleven months previous to the commencement of treatment. A tumour of the size of a large orange, having the characters of an aneurism, existed to the left of, and slightly above, the umbilicus. Pressure could be made on the aorta above the tumour, and arrested the pulsations. Chloroform having been administered, pressure by a horse-shoe tourniquet was made for the space of two hours ineffectually, so far as the production of any change in the tumour was concerned.

Three days after the first attempt, pressure was again applied, chloroform having been first administered. The pressure and insensibility were maintained for five hours, and only during the last hour did any appreciable alteration take place in the tumour. After the removal of the pressure very slight pulsations were felt in the tumour; and in the evening of the day these ceased entirely, as well as the pulse in the aorta below the tumour and in the vessels of the lower limb. Seven days after the second application of pressure the patient walked about a quarter of a mile, the tumour being pulseless and the collateral circulation established. From this time the patient enjoyed good health, without any recurrence of pulsation until the commencement of the sixth year following (1870) During the interval which occurred between 1864 and 1870, the patient was employed at light work; in the latter year he was obliged to resume his old occupation as a paviour, and soon he began to suffer from the symptoms of aneurism higher up in the abdomen than the seat of the former disease. These new symptoms terminated in his sudden death. The *post-mortem* examination proved that death was caused by the giving way of an aneurism seated in the portion of the aorta, from which the cœliac axis springs. The aorta at the seat of the first disease was a mere fibrous mass, while the branches springing above it were greatly enlarged, chiefly the superior mesenteric. The circulation was carried on through these vessels and the anastomisis of the intercostal arteries. Dr. Murray strongly advocates the adoption of the practice of complete arrest of the current in aneurismal tumours, in order to induce coagulation of the blood contained by them, in preference to the older method of

partial arrest, practised with the object of producing laminated deposit of fibrine in the sac.

The Antiseptic System. By Arthur Ernest Sansom, M.D., Lond.; Memb. Royal Coll. Physicians; Physician to Royal Hospital for Diseases of the Chest, &c.   London: Henry Gillman. 1871. 351 pages.

At the present time, when the minds of medical men are so occupied with the consideration of the antiseptic treatment of disease, we would hail with pleasure almost any work tending to the elucidation of the subject, but with special pleasure must we receive a work such as that now produced by Dr. Sansom. Though we must consider the question as being still *sub judice* we gain in the present volume a condensed statement of the arguments in its favour and of the cases reported of its use, while references are given to the original communications which have been published on the subject. With the form in which the work is presented to us no fault is to be found, while a number of plates (chiefly after Beale and Hallier), are added in illustration of the text. Many of Dr. Sansom's conclusions are, as he frankly owns, drawn from the work of M. Lemaire, published in 1865, but much also he has put to the test of personal experience.

In the earlier part of the work a history is given of the introduction into practice of this mode of treating disease, followed by an account of the chemistry of carbolic acid and of its action on fermentation and putrefaction. Of its chemistry it is sufficient to state that for practical purposes a saturated solution in water may be considered to contain about 5 per cent. of the acid, and that to obtain uniform solution it is best to shake the acid first with four times its bulk of *hot* water and afterwards to add the cold. We have then a clear statement given of the experiments and arguments which have been on either side brought forward by the upholders of the two chief theories on the nature of putrefaction— the one party holding that the first changes in the process are chemical and act on some putrescible albuminous matter, inducing in it conditions such that ordinary physical forces suffice to transform it into organisms possessing an independent life. This is known as the theory of " spontaneous generation." The other party holding that the first cause of putrefaction is to be found in

certain vitally-endowed particles existing in the air, which finding suitable soil for their development in the putrescible matter, there germinate and give rise to putrefaction. This is the theory known as "the germ theory," and to it Dr. Sansom gives his decided adherence. These germs he considers moreover (though allowing that proof is still wanting on the subject) to be of vegetable origin and fungoid in their nature. The various proofs of their existence he gives at considerable length, and proceeds then to show the numerous minor uses to which carbolic acid may be applied, such as the preservation of meat, &c. Here an interesting question arises as to what is the nature of the *materies morbi* of infectious diseases, and how does it occur that some only of the many persons exposed to infection are attacked by the disease. As to its nature he says :—

" I have been led to enunciate the theory that the poisons of spreading diseases are extremely minute living organisms, having the characteristic endowments of vegetable growths, analogous to the minute particles of vegetable protoplasm whose function it is to disintegrate and convert complex organic products, owing their specific properties in the special disease, not to any botanical peculiarity, but to the characters implanted in them by the soil in which they first sprang from innocuous parents, and from which they are transmitted— this soil (except in the case of their earliest origin) being the fluids of the animal body."

Thus he points out many persons may breathe an infected atmosphere containing these noxious particles, yet without inhaling any of them at all, and that, even supposing them to have entered the air passages, it is probable that there is required a peculiar condition of the secretions of the parts to favour their development for the production of disease.

We come now to that part of the work which is, after all, the most really important, viz., the practical application of the antiseptic method in the treatment of disease. Here it may be well to guard against the error of supposing the term antiseptic treatment and treatment by carbolic acid to be identical. On the contrary, Dr. Sansom prefers, after operation, to use in the first instance some of the mineral antiseptics, more especially a solution of chloride of zinc (40 grs. to the oz.) with which the wound is sponged, using then the carbolic acid as the permanent dressing. Although M. Lemaire had used carbolic acid as early as 1860, in the dressing of wounds, yet it is to Mr. Lister that we are most indebted for its

introduction into general use. The theory on which this system of treatment is founded is often much misunderstood, and the primary action of the germs placed in a position much more prominent than that awarded to it by Mr. Lister. His doctrine may be thus briefly stated in the words of Dr. Sansom :—

" Pus is the product of the degraded germinal matter of an organism, and its formation is due to any local irritation which reaches a certain intensity. There are many varieties of irritation which can produce suppuration. Direct violence will induce it even when the skin is unbroken, and there is no possible influx of germ-laden air. Local disorders of innervation can induce it. It is a matter of common observation that chemical agents, as caustics, cause its production. Moreover carbolic acid itself will cause irritation and suppuration; therefore not only is an antiseptic not necessarily a preventative of suppuration, but can itself cause it. The one fact we have arrived at is, that the *cause* of suppuration is *irritation*. Whilst, therefore, the idea of the direct influence of atmospheric germs as inducing suppuration is effectually disposed of, it may yet be that the irritation arising from the putrefaction of wounds is a potent cause of suppuration, and, therefore, though not the direct, may yet be the chief cause."

In the following words he describes the changes occurring in a wound exposed to the air :—

" The first change noted is oxidation. The normal alkaline fluid of the muscles becomes acid; the change is hastened by warmth or moisture of the air or by the presence of organic impurities; it is retarded by dryness and cold. It is, however, clear that mere acidity of the fluid is not the cause of unhealthiness, for we well know that dressings of an acid re-action (notably sulphurous acid) have tended to a prevention of suppuration and a rapid cicatrization. Now, the occurrence of putrefaction in an open wound is a matter of certain knowledge, and it is scarcely necessary to urge that it is a source of danger. Every one knows that a fœtid condition of a wound is an adverse, while a clean and inodorous condition is a favourable sign. Whenever there is a putrefactive condition of a wound there is irritation—irritation manifested not only in the exposed tissues of the wound, but in the system of the individual subject to the injury."

He concludes :—

" From all sides, then, I consider the evidence supports the statement of Professor Lister with regard to wounds—that of all external agencies, the most injurious by far is putrefaction."

The object then of the application of antiseptics is simply to prevent this putrefaction and consequent irritation, not, as is sometimes erroneously supposed, to prevent altogether the formation of pus, which may occur even where no air has permeated, as is the case in abscesses, &c. To obtain these benefits, however, to their full extent, the practitioner must, according to Mr. Lister, most carefully attend to every detail, so that nothing may touch the wound except it be thoroughly carbolized. Even in changing the dressing he insists on the necessity of carefully keeping up the antiseptic action by the use of the spray of carbolic acid thrown by Richardson's instrument for local anæsthesia, a solution of one part acid to 40 water being used for the purpose.

He even goes so far as to say :—

"If when the dressings are removed, a single drop of serum were to be pressed out by the movement of the limb, and then regurgitate into the interior after being exposed for a second to the influence of septic air, putrefaction would be pretty certain to occur."

For the purpose of dressing wounds the acid has been used in many forms. Of these the following are the more useful :—

1. *Carbolized Oil.*—Prepared by dissolving one part of pure acid in five parts olive, linseed, or any fixed oil. This and the following preparation, though not as effectual as others, are yet convenient as being easily prepared, and are much used for compound fractures, opening chronic abscesses, and the dressing of small wounds.

2. *Carbolized Putty.*—Made by adding to two or three ounces of carbolized oil a quantity of whitening sufficient to form a firm paste. It is best used covered by tin foil or sheet lead.

3. *Antiseptic lac Plaster* is thus prepared :—Shellac, three parts; crystallized carbolic acid, one part; heat the lac with about one-third of the acid at slow heat till completely melted; remove from the fire and add rest of acid; stir briskly till thoroughly mixed; strain through muslin, and when the liquid has sufficiently thickened spread to thickness of one-fiftieth of an inch; brush the surface lightly with a solution of gutta-percha in about 30 parts of bisulphide of carbon. When dry it can be kept without adhering rolled in canisters. This is a very useful preparation, as it retains the acid with tenacity. If required to adhere, the gutta-percha is removed by friction and brushing the surface with liquid carbolic acid. If the dressings, however, require frequent change, its non-adherence is obviously of great advantage.

4. *Antiseptic Muslin Gauze.*—Paraffin, 16 parts; resin, 4 parts; crystallized carbolic acid, 1 part; melt together; cheap muslin gauze is dipped in the melted mass and well wrung while hot. This preparation is perhaps the most useful of all. It is quite unirritating, very retentive of the acid, and has but little odour. It is to be applied folded in about 8 layers. Boiling water entirely removes the paraffin, so that the gauze can be repeatedly used. This is the most convenient form for use after amputations or other operations.

So much for the treatment of open wounds. Our author next proceeds to the treatment of certain surgical affections—boils, gonorrhœa, external syphilis, ulcers, cancer, &c. In all these cases, however, further experiments are required before the true value of the mode of treatment can be determined.

With regard to the internal administration of carbolic acid it must in like manner be confessed that data are still wanting for the formation of any satisfactory opinion. The cases of its use are yet too few, and the testimony as to its success yet too contradictory, to be of much service. The following are a few general rules for its administration:—

It should not be given soon after a full meal, as it forms combinations with albumen, fats, and other alimentary substances. According to Lemaire the commencing dose for children is about $1\frac{1}{2}$ grs., dissolved in an ounce and a half of sugared water; for adults, about $7\frac{1}{2}$ grs. in two tumblerfuls of sugared water, night and morning, four hours after a meal, the dose gradually increasing to 15 or 20 grs. It is *contra-indicated* when the nervous system or pulmonary tract show any signs of inflammation or congestion. The only effect on one in health found to follow moderate doses was the production of a peculiar greenish tint in the urine, and the disappearance of all deposits of lithates. In spite of this latter power, when given in cases of gout, though it rendered the urine clear, it did not appear to modify the gouty action or check its continuance, and the same may be said of its action on rheumatism. It has been administered internally with apparent advantage in certain cases of dyspepsia, chronic bronchitis, hooping cough, and constitutional syphilis; while its external application to the pustules of small-pox seems to have been attended with marked benefit. For the latter purpose the acid liquified by means of a small quantity of water or alcohol is used, and the effect is found to be better when each pustule is separately touched than when a lotion is used over the

entire substance.   In other diseases, however, such as cholera, enteric fever, ague, scarlatina, &c., in which carbolic acid has been used, the results have been by no means so encouraging.   In the latter part of the work Dr. Sansom introduces to our notice a number of double salts of carbolic acid which he finds in some ways more convenient for internal use than the pure acid, but with regard to these also sufficient evidence cannot as yet be produced to show their true value, though Dr. Sansom's experience, as far as he has yet tried them, is favourable.

In an appendix a number of formulæ are given, some of which have been copied above.   Of the remainder, the following are useful:—

Antiseptic Adhesive Plaster is made by dipping ordinary strapping plaster in hot solution made by mixing one part of one to twenty lotion with two parts boiling water.   Adheres to moist skin so that it may be applied under spray.

Antiseptic Catgut Ligature.—The ligatures are steeped in carbolized olive oil, having a small quantity of water diffused through it.   The water renders the gut supple, and changes it so that it may be placed in a watery solution at the beginning of an operation without swelling or changing in strength or bulk.

Such is a short outline of Dr. Sansom's work—a work which has been much needed, giving as it does, in a convenient form, an epitome of the various papers previously published by Mr. Lister and other observers up to the present time, and bringing them within a compass easily attainable by all.

A Treatise on Gout and the Allied Affections.   By PETER HOOD, M.D.   London: J. and A. Churchill.   Pp. 417.

THIS treatise has been composed, as we are informed by the author in the preface, for the purpose of putting on record the results of long practical experience in the observation and management of gout and rheumatism.   There is no class of works more valuable than those which embody the ripe conclusions of physicians who have been largely and long engaged in the actual treatment of disease.   Their value depends on their containing the results of accurate observation of the varying aspects of maladies, and careful estimates, founded on repeated trials, of the efficacy of remedies in their treatment.   We cannot congratulate Dr. Hood on having

made a permanent addition to the not very ample list which we possess of such works.

A considerable portion of Dr. Hood's work is taken up with accounts of the different pathological theories which have been proposed regarding gout, and with observations upon them. In these commentaries Dr. Hood does not seem to display much originality or acuteness of appreciation. For example, he appears (p. 35) to have completely misapprehended the well-known views of Dr. Garrod regarding the causation of gout. At the same time we must observe that the reader is not likely to be misled by the author's mistake, as Dr. Garrod's summary is quoted *in extenso* almost immediately after.

Nor can we attach as much importance as we could desire to Dr. Hood's suggestions regarding treatment, when we find evidence— as in the following passage on the management of hemorrhoidal bleeding in gouty persons—of a credulity with which we should have scarcely expected to meet in a medical work of the present day :—

" There is a chronic form of hemorrhoidal bleeding that is often most difficult of cure, and of which I have seen several instances. One very remarkable case I will relate ; and I would not venture to do so if I could not entirely rely upon the veracity of my informant, who had been for many years a sufferer from this malady. His fees to medical men had quite impoverished him, and ultimately rendered it necessary for him to obtain the hospitable shelter of the Charter House, where he ended his days at the age of eighty-seven. In giving me the history of his case, he told me that he had been a sufferer for twenty years from an almost daily discharge of blood from his bowels, which kept him so weak that he was scarcely capable of attending to his business. He was a glover by trade. He had consulted all the best medical men and surgeons of his day, and amongst the latter I remember was Sir Astley Cooper and Chevalier. No one did him any good. An old woman came into his shop one day, and addressed him thus :—' Mr. M——, you look very ill ; would you mind telling me what is the matter with you ?' He felt no hesitation in doing so. And his visitor replied, ' I thought by your appearance you were suffering from a loss of blood, and that is why I asked you. If you will do as I tell you, I will cure you. Get a piece of alum the size of a pigeon's egg, and carry it constantly in your breeches pocket, and I will call in a fortnight to ask you how you are.' She called at the time she promised, and Mr. M—— was able to inform her that at the end of a week the bleeding had stopped, and he had no return of it. This recital appeared to me as strange as the belief that many people formerly entertained of the

efficacy of carrying a cramp bone in the pocket for the prevention of cramp ; but although I felt incredulity, I expressed none, as I knew that my informant would relate only what he believed to be true. I asked him how long it was since he commenced to act on the old woman's advice. He replied, ' Twenty years ; and I have never had any return of the bleeding.' I inquired whether the alum that he carried in his pocket diminished in size. He said that it wore away after a few weeks, and he had occasion to renew it constantly. He put his hand into his pocket, and produced a piece of alum that he had purchased only the day before. When I learned that the alum wore away, I was not so surprised as at first, and an explanation of the *modus operandi* of so simple a remedy occurred to me. The heat and moisture of the body had acted upon the alum, and caused it to give off its astringent property, which, being absorbed by the skin, exerted its influence upon the pelvic viscera and blood-vessels. The effect was to constringe the hemorrhoidal vessels and to put a stop to the flow of blood. I have tried this simple remedy in several instances, and usually with success. When ordered for females, I make them wear a piece of alum in a small packet suspended from the waist ; and I have some interesting daily records of the diminution of the flow of blood from the bowels, when the cases have been suitably selected."

We would gladly have spoken in different language regarding this work; and we must, in justice to Dr. Hood, add that his book contains some curious anecdotes, gives evidence of rather extensive reading, and has not a few remarks and observations characterized by practical good sense.

WORKS ON MATERIA MEDICA.

A Manual of Practical Therapeutics. By E. J. WARING, M.D., F.L.S. Third Edition. London: J. and A. Churchill, 1871. 8vo, pp. 875.

WE have always felt that Waring's Manual was the best condensation of therapeutics with which we were acquainted, and are only surprised that it did not reach a third edition long since. The new edition has been to a great extent re-written, some of the articles—*e.g.*, antimony, calomel, and blood-letting—considerably abridged, several judicious omissions made, and altogether the improvements have been real and substantial. All the important new remedies, such as chloral, nitrous oxide, apomorphia, &c., receive due notice, and, notwithstanding these and other additions,

this edition, as compared with the last (1865), shows a decrease in bulk to the extent of 81 pages, while its sphere of usefulness is increased.

It is an admirably concise, and, so far as can be at present, a satisfactory compendium of therapeutics, written with honesty of purpose, and compiled with much judgment. The first and larger part, devoted to the consideration of the remedies in alphabetical order, is decidedly the best. The second part, which treats of remedial means and classes of medicines—*e.g.*, ampuncture, anæsthetics, antidotes, hypodermic injection, &c.—is more unequal in execution. Some subjects of importance are passed over, while others—*e.g.*, electricity—are imperfect and behind the times. But, with these few exceptions, we do not know any work of such high practical utility, nor one so well fitted for a consultant's vade-mecum, or as a companion to the country practitioner cut off from ready access to other works. A copious and useful index of diseases, with the more trustworthy remedies marked by an asterisk, concludes the volume.

Contributions towards the Materia Medica and Natural History of China, for the use of Medical Missionaries and Native Medical Students. By F. P. SMITH, M.B., Lond.; Medical Missionary in Central China. Shanghai: Amer. Presbyt. Miss. Press. London: Trübner and Co. Large 8vo, pp. 237.

MR. PORTER SMITH has produced, as the fruit of his leisure hours, a compilation which is valuable to workers at home as a book of reference, and cannot fail to be of service to the classes for whom it is intended. The articles are arranged alphabetically under their English or their botanical names, usually the latter, followed by the Chinese synonyms, and the printing and bringing out of the work are creditable to the Shanghai press.

The Chinese materia medica reckoned among its earlier contributors, emperors, princes, and magistrates, but their mantle seems to have fallen on a more degenerate race, for little advance has been made, and their pharmacopœia would certainly require extensive pruning and revision. Nearly all the medicines referred to are derived from the vegetable kingdom, for Chinese doctors, as a rule, employ few mineral substances as internal remedies. The only acid of which they have any definite knowledge is vinegar; hence it is employed in many of their chemical processes. The largest

amount of Chinese original matter has been derived from a work
compiled by a district magistrate, which has run through several
editions, notwithstanding its portentous dimensions of thirty-eight
volumes, and which may be obtained by the curious at Ningpo or
Canton.

WORKS ON ELECTRICITY.

*A Practical Treatise on the Medical and Surgical Uses of Electricity,
including Localized and General Electrization.* By G. M. BEARD,
A.M., M.D.; and A. D. ROCKWELL, A.M., M.D. New York:
Wood and Co. 1871. 8vo, pp. 698.

Observations on Galvanization of the Sympathetic. By the same.
New York: 1870. Pp. 16. (Extracted from the preceding
work.)

Galvano-Therapeutics. By W. B. NEFTEL, M.D. New York:
Appleton and Co. 1871. Pp. 161.

BY the publication of the works named above, as well as by the
preceding volumes of Garratt and Morgan, and by the translation
of Meyer's treatise, the Americans have shown themselves not
behindhand in appreciating the importance of a thorough study of
electro-physiology and therapeutics. There is certainly no longer
a dearth of quantity in the literature of medical electricity; the
point of quality is not always so well sustained. As the multitude
of works on this subject is a sign of its growing popularity, so is
there now great danger of electricity becoming too fashionable a
remedy. Certain difficulties, technical and doctrinal, belong of
necessity to its proper application, and hence it is very doubtful if
electricity can ever be as freely and generally employed as its more
zealous advocates might desire.

One of the cardinal questions now at issue is the *rationale* for the
differential use of the direct, or so-called constant current, and of
the induced, or so-called interrupted current. This has been, to
some extent, cleared up, and we are rapidly becoming freed from
the trammels of a one-sided preference for either form of electricity
exclusively. The great improvements which have been made in
the construction of the various batteries and other physical apparatus
have greatly contributed to this result, and the constant galvanic
battery will soon be within the reach of every one. Generally, it

may be said, that the employment of electricity in medicine has passed through several eras corresponding with the stages in its physical history. No experiments of any value were instituted until the middle of the 18th century, after the discovery of the friction machine and the Leyden jar, and to Kratzenstein belongs the credit of having been the first to use frictional electricity with success for the cure of a paralysed finger.

Electro-physiology owes its origin to the celebrated discovery of Galvani in 1789, and the construction of Volta's pile in 1800 introduced the constant current into practice. From various causes, not necessary now to enter upon, the healing powers of the new remedy fell into disrepute, and the history of electro-therapeutics during the first three decades of this century presents a confused jumble of ignorance, superstition, and charlatanism, occasionally relieved by the support of a few really honest advocates.

Faraday's pregnant discovery of induction-currents, in 1831, opened up a wider field of application, and from that date to the present time the physiological and therapeutical aspects of electricity have been successfully prosecuted by a host of distinguished observers.

The virtues of the constant current seemed to be lost sight of for a time, until Robert Remak again took up the investigation of its effects with brilliant results, and although he unfortunately drifted into the opposite extreme of denying the claims of the induced current to any therapeutical value whatever, we all must indorse the words of Graefe, that " Remak, by introducing the constant current into the practice of medicine, enriched it with an invaluable treasure."

A more recent writer, and one who cannot be accused of hyper-credulity, Niemeyer, is " fully convinced that the introduction of the constant current into practice is one of the most valuable advances of modern times, and that *in the constant current we have a means, more powerful than any other, of modifying the nutritive conditions of parts that are deeply situated.*"

The treatise of Drs. Beard and Rockwell seeks to embody in a compact, practical form, all that is now known of the application of electricity to the treatment of disease, and their extensive experience of the uses of electricity in a wide variety of morbid conditions qualifies them to speak with authority. For convenience of reference and in order to avoid repetition, the work is divided into electro-physics, electro-physiology, electro-therapeutics, and electro-

surgery, and the authors have done wisely in restricting the two former sections within moderate limits.   For, in the present *canine appetite* for precision, there is much reason to fear, with Niemeyer, that the rationalistic and doctrinal teachings about galvano-therapeutics, which are recently so popular, and the attempts to make this so " exact," may interfere with moderate and experimental observation, and injure the popularity of an important remedy.

The third section of the book naturally receives the most attention, the comparative value of the galvanic and Faradic current is clearly and succinctly pointed out, and the principles and practice of localized electrization are fully discussed.   The authors devote a considerable space to an elaboration of their views, on the theory and use of a method which they have originated and described under the term, " general electrization."   They describe such very remarkable results from its employment, though with moderation and plausibility, that we hesitate to receive their views implicitly without further confirmation.   If all they say be true, there is much, very much, for us to learn yet.   The object proposed in general electrization is to bring every portion of the body under the influence of the electric current, so far as is possible, by external applications. This is best accomplished by placing one pole (usually the negative) at the feet or the coccyx, while the other is applied all over the surface of the body.   On the whole, though there is certainly some redundancy of matter, and perhaps too much is claimed for electricity, we can really congratulate Drs. Beard and Rockwell on the production of a very exhaustive work, thoroughly up to the times, and evincing an intimate familiarity with the subject, a cordial recognition of the labours of home and foreign writers, and a laudable desire to give an honest account of their cases, not magnifying their successes nor concealing their failures.   The book is neatly brought out, is illustrated with over 100 engravings, and concludes with a good index and a glossary of the principal terms used in medical electricity.

Dr. Neftel's little work is but the forerunner of a larger and fuller treatise on the relation of the galvanic current to physiology, medicine, and surgery.   It treats of the physiological and therapeutical action of the galvanic (direct) current upon the acoustic, optic, sympathetic, and pneumogastric nerves.   In reference to the acoustic nerve, a subject generally passed over in a few words, many interesting details are given, taken from Brenner's researches, and confirmed by the author.

The Principles and Practice of Midwifery, with some of the Diseases of Women. By Alexander Milne, M.D., Author of "Manual of Materia Medica and Therapeutics," &c., &c. Edinburgh: E. and S. Livingstone.

It surely required some courage to undertake the writing of a new hand-book on Midwifery. Have we not had in modern times the great quarto volume of Hodge, an Encyclopedia in itself, and the large octavo of Bedford, and the translation of Cazeau sent to us from America ? And, at home, have we not the smaller volumes of Tyler Smith, and of Rigby, the more recent ones of Meadows and Swayne, besides the long-established text-books of Murphy, Ramsbotham, and Churchill, whose popularity is shown by the great number of editions they have reached ?

And yet here is another claimant for the student's notice, another prophet coming forward to teach, another guide offering his services to seekers after obstetric knowledge; and one who, notwithstanding the apparent hopelessness of the task, has succeeded in throwing such a measure of freshness into his teaching, and in putting the more important principles so clearly, and bringing them out so prominently, that we have no doubt his manual will prove a valuable one to students, and be found useful by those practitioners who may require clear and definite information of a concise character when difficulties arise. We like his method of stating his rules of practice in distinct paragraphs. Thus the student sees at once the circumstances under which operations are called for, and the methods that may be adopted for their performance; and, though his experience in after-life may lead him to alter or modify his conclusions, he obtains that which is the great want of all students—clear and definite views of what is to be done, and of how to do it. Nor do the author's flashes of wit and scraps of rhyme interfere with this, but serve rather to fix attention and assist the memory.

In his Preface, Dr. Milne draws attention to his recommendation to afford early assistance in the second stage of labour as one of the most important features of his book. We have missed no opportunity in this journal of urging this practice. We look on the early use of the forceps as one of the most important improvements in obstetrics, but we cannot agree that a case should not be allowed to go on for the space of even one hour after the first stage is completed, or that the forceps should be used once in

every three-and-a-half or four labours, as might be inferred to be
Dr. Milne's opinion, from what he says in the chapter on powerless
labour. We very much prefer his teaching where he speaks, further
on, of the use of the forceps themselves, where, after showing that
most of the evils ascribed to their use are due to delay in using them,
rather than to their use, he goes on to say—"The great thing is then,
not to employ the forceps when they are not required, and not to
delay applying them when they are really needed. When are they
required? When we find that the impediment cannot be overcome
by the powers of nature, the uterine contractions, and the voluntary
or respiratory efforts; where these natural powers are wanting or
feeble, and cannot be roused by ergot, &c., and when, of course, we
are of opinion the head can be brought down without tremendous
force calculated to bruise seriously the maternal parts or crush
injuriously the fœtal head." We would like to modify this by
omitting the allusion to ergot, which we think too dangerous a
weapon to be used as an alternative for the forceps, and we would
add that the condition of the mother's pulse is of more importance
than the length of time the labour may have lasted.

We congratulate Dr. Milne on the manner he has completed
his self-imposed task, and trust his book may be successful.

WORKS ON MINERAL WATERS.

1. *Our Baths and Wells: The Mineral Waters of the British
   Islands, with a List of Sea-Bathing Places.* By JOHN
   MACPHERSON, M.D.; Inspector-General of Hospitals, H. M.
   Bengal Army (Retired). London and New York: Macmillan
   and Co. 1871. Fcap. 8vo, pp. 205.
2. *Lisdoonvarna Spas and Sea-Side Places of Clare.* By E. D.
   MAPOTHER, M.D.; Prof. Royal Col. of Surgeons; Surgeon to
   St. Vincent's Hospital. Dublin: Fannin and Co. 1871. Pp. 47.

ON a previous occasion we commended Dr. Macpherson's " Baths
and Wells of Europe," and we have pleasure in now drawing the
attention of our readers to his smaller work on the mineral waters
and sea-bathing places of the British Islands; the information it
contains is sufficient for all ordinary purposes, and the estimate of
the various spas is, in our opinion, impartial and judicious. To the
spas and sea-side residences of Ireland we think Dr. Macpherson
accords sufficient space and we are satisfied—there was no necessity,
however, for his informing us with something of a sneer that we

need not dread being disturbed in our spas by an inroad of Saxon visitors, and that we will have no trouble in keeping Irish spas for the Irish. We fear that since he exchanged his mansion in Chowringhee for his house in Curzon-street he has imbibed some of the unwholesome prejudices of Mayfair. Extensive experience has convinced Dublin physicians that the spa, to the description of which the second book on our list is devoted, may compete with any English or Continental water. Dr. Mapother has done good service in supplying us with an account of Lisdoonvarna. He has had frequent opportunities of observing the effects produced by the spa on his own patients and on those of other Dublin physicians. He has made himself acquainted with Lisdoonvarna by a visit, and he has had such experience of other waters that he is competent to form a comparative estimate of its virtues. His little *brochure* will accordingly be found a thoroughly reliable guide. We have ourselves seen such good results in cases of gout and gouty neuralgia, and of diathetic disturbances of the respiratory and digestive organs, that we feel convinced Lisdoonvarna will maintain the reputation it has acquired if those who visit it could procure suitable accommodation. The proprietors of the present hotels there have the chance of making their fortunes, and if they chose to throw it away by failing to supply such accommodation as invalids require, it is devoutly to be hoped some enterprising stranger will undertake that duty. The unfortunate sufferers from the ailments Lisdoonvarna is fitted to cure are generally persons who have been accustomed to every home comfort, and who are able and willing to pay for airy rooms and a well-appointed table. As far as we can gather from those who have been guests at Lisdoonvarna, there is no want of good meat and good fish, but little attempt is made to cook and serve these in a way to tempt the palate or lessen the labour of a feeble stomach. Perhaps the charges are too low; if so, by all means raise them. Ignorance rather than parsimony seems the sin of the hotel-keepers, and probably the best way they could spend a twenty pound-note would be in going over to Harrogate, and staying a week at the Queen, or running up to Portrush, and remaining for a similar period at the Antrim Arms, though we have reason to know if they were disposed to learn their business, they could see a good deal nearer home at Kilkee, Miltown Malbay, and Tramore. We earnestly hope they will do so before next summer, and make their fortunes in consequence.

PART III.

QUARTERLY REPORTS.

------◆------

REPORT ON
MATERIA MEDICA AND THERAPEUTICS.[a]

By WALTER G. SMITH, M.D., Dubl.; Fellow and Censor,
K. & Q.C.P.I.; Senior Demonstrator of Anatomy in the School
of Physic, T.C.D.; Assistant Physician to the Adelaide Hospital.

MATERIA MEDICA AND GENERAL THERAPEUTICS.

1. *The Chemical Nomenclature of the Pharmacopœia.*—Dr.
Attfield has just issued in separate form a paper read last spring
before the Pharmaceutical Society, which embraces a subject of
much interest to the prescriber and dispenser, viz., the alteration
in pharmacopœial nomenclature, necessitated by the advance of
chemistry. The chief alterations in pharmacopœial nomenclature
now proposed amount to this, that the compounds of the alkali-
metals and alkaline-earth-metals, instead of being named as hitherto
on two distinct systems, should follow but one— that instead of
salts of potassium and of potash we should have salts of potassium
only; instead of sodium and soda compounds, sodium only; and so
with preparations of ammonium, lithium, calcium, magnesium, and
aluminium. This is a step in the direction of simplicity and per-
manency, and away from that of theory. The one great fault of
chemical nomenclature, in relation to medicine and pharmacy, is
mutability, and it must be gratifying to Dr. Attfield that such
eminent authorities as Professors Frankland, Odling, and Redwood,
as well as the leading weekly medical periodicals, have entirely con-
curred with his main proposition. Certain exceptional alterations
were also proposed on which some difference of opinion naturally
arose, and it is to be hoped that the main features of Dr. Attfield's
plan will be adopted not only in the British Pharmacopœia but
also in those of other countries.

---

[a] The author of this Report, anxious that no contribution to the subjects of Materia
Medica and Therapeutics should remain unnoticed, will be glad to receive any publi-
cations which treat of them. If sent to the correspondents of the Journal (see page 13.)
they will be forwarded.

2. *Incompatabilities.*—(α). *Digitalis and Quinine.*—A physician having ordered a mixture containing the syrup of digitalis of the French codex (1 part tr. to 40 syrup) and acid sulphate of quinine, observed a precipitate at the bottom of the bottle, and this, on examination, turned out to be tannate of quinine (*Pharm. Journ.*, Mar. 11; from *Journ. de Ph. et de Chim.*) Tannic acid has been recommended as an antidote to digitaline itself, and it is probable that other organic acids besides tannic acid (digitalic, antirrhinic, and digitaleic) entered into the formation of the precipitate alluded to.

(β). *Quinine and Iodide of Potassium.*—The following prescription was dispensed: ℞ quin. sulph. gr. xv., pot. iod. ʒi., tinct. ferri chlor. ʒi., aquæ ʒiv., syr. zingib. ʒi. M. A brown precipitate was at once formed whether the quinine was dissolved by the aid of a little dilute sulphuric acid or not. Mr. Maisch ascribes the formation of the precipitate, which is a hydriodate of quinine, to the production of some KI_2, for neutral potassic iodide will not precipitate sulphate of quinine (*Pharm. Journ.*, Mar. 18; from *Amer. Journ. of Pharm.*) Solutions of salts of the vegetable bases for the most part, when mixed with potassic diniodide, KI_2, (*e.g.*, a solution of I in KI) yield precipitates insoluble in water, but soluble in boiling alcohol.—(Miller.)

3. *Purity of Drugs.*—(α). *Spir. Ammoniæ Arom.*—The results of the analysis of six samples, obtained from different druggists, are given in the *Practitioner* (quoted in *Pharm. Journ.*, Jan. 21, 1871). The percentage of ammonia in the pharmacopœia article is 2·6 (2·47?) and of alcohol 62·6, but, in the specimens examined, the ammonia ranged from 2 to 1·2 per cent. In all except one, the percentage of alcohol was much below the mark, and in one case, as low as 48·1 per cent.

(β). *Bismuthi Subnitras.*—Six samples were examined which yielded remarkably good results. No indication of arsenic was found in any of them, and only traces of chlorides and sulphates. The percentage of oxide of bismuth ranged from 78·5 to 82·3, the proportion varying according to the amount of washing and the temperature maintained during precipitation.—(*Practitioner*, Mar.)

4. *Synthesis of Conia.*—Dr. Hugo Schiff of Florence has succeeded in obtaining artificially a product which appears to be identical with conia, the active principle of hemlock. If so, it is

the *first* instance of the synthesis of an organic alkaloid. When alcoholic ammonia acts upon butyraldehyd, at a temperature not above 100° C, dibutyraldine is one of the products formed ($C_8H_{17}NO$) and the dry distillation of this base furnishes conia ($C_8H_{15}N$) for, $C_8H_{17}NO = H_2O + C_8H_{15}N$.—(*Pharm. Journ.*, Jan. 28, 1871; from *Journ. of Botany*.)

5. *Ferric Iodates.*—In the *Dubl. Quart. Journ.* for May, 1869, Prof. C. A. Cameron proposed the employment of ferric iodate as a substitute for iodide of iron, a preparation especially prone to decomposition. The advantages claimed for the iodate are its greater stability and convenience of administration.

In the *Pharm. Journ.*, Feb. 4, 1871, Mr. Chichester Bell, M.B., points out that there appear to exist at least three well-defined compounds of ferric oxide and iodic anhydride. One of these, a basic salt, is prepared by precipitating iron alum by an alkaline iodate, and answers to the formula $Fe_2O_3, 2I_2O_5, 8H_2O$. It is a yellow powder, darkening on exposure, and nearly insoluble in water. This is the salt suggested for use by Dr. Cameron. Another, more strongly basic, iodate, Fe_2O_3, I_2O_5 can also be prepared, but the most stable combination, according to Dr. Bell, is the normal ferric iodate $Fe_2O_3, 3I_2O_5$ or $Fe'''3IO_3$, prepared by adding to a solution of ferrous iodide chlorate of potassium, and then an excess of strong nitric acid. It contains 9·64 per cent. of iron and 65·57 per cent. of iodine.

6. *Phosphorus.*—*Turpentine as an Antidote.*—In the reports for August, 1869, and February, 1870, some notice was given of M. Personne's experiments on oil of turpentine as an antidote to phosphorus. In the report for August, 1870, the observations of MM. Curie and Vigier were quoted in opposition both to M. Personne's theory and experiments. More recently, Köhler and Chimpf have repeated Personne's experiments, and report the following results in the *Berlin Med. Wochenschrift*—(1.) Commercial oil of turpentine is a good antidote to poisoning by phosphorus; there is no fatty degeneration of the tissues, nor is there any free phosphorus in the urine or fæces of animals experimented on. (2.) Phosphorus and turpentine oil form in the stomach a compound resembling spermaceti. In dogs this was found to be readily excreted, or the phosphorus passed away slowly oxidized in the urine.—(*Ph. Journ.*, Feb. 25, 1871; from *Weiner Med. Wochenschr.*)

7. *Tincture of Hyoscyamus.*—Mr. Donovan ascertained some
years since that as much as one ounce of the tr. hyoscy, of the
Dublin Pharmacopœia, carefully prepared from leaves of one year's
growth, could be taken at once without any inconvenience beyond
dryness of the throat and fauces. Long before this Mr. Houlton
had affirmed the inertness of the one-year-old plant, and the activity
of that of two years' old, and Mr. Donovan has since confirmed his
observations. Mr. Donovan procured a tincture certainly made
from the two-year-old plant, and after taking ℨi. felt no effect beyond
dryness of the mouth. On a subsequent occasion he took ℨij. and
in two hours was unmistakably made aware of its activity, for he
felt giddy and confused, with a sensation of uncertainty in walking.
As an easy test to discover the age of the plant from which a given
tincture has been prepared, he proposes the following:—Add a
little of the tincture to a glass of water; if the mixture become
slightly milky, the tincture was made from a two-years-old plant;
if it remain transparent, the plant was in its first year.—(*Med. Press
and Circ.*, April 26, 1871.)

8. *Home-made Lime-water.*—A caution is suggested by the
following case. At an inquest held at Birmingham, it was shown
that a patient having been directed, among other things, to take a
certain amount of lime-water every day, but not being told whether
to buy it or make it himself, straightway procured some lime, mixed
a lump with water, stirred it, and drank the thick mixture. A few
hours afterwards acute symptoms of gastritis set in, resulting in
death.—(*Pharm. Journ.*, Feb. 11, 1871.)

9. *Manganese and Nickel.*—In order to test the truth of his
hypothesis that substances closely allied chemically should have an
analogous action on the system, Dr. Broadbent has tried salts of
these metals in cases of anæmia with the object of comparing their
effects with those of iron. Manganese and nickel were given as
their chlorides, respectively, in infusion of quassia, associated with
hydrochloric acid. Dr. Broadbent is able to say distinctly that
under the use of these metals he has seen the strength improve and
colour return, and this in out-patients without the advantages of
warmth, rest, and superior food afforded by admission into hospital.
Manganese is much better borne by the stomach than nickel, and
causes no disturbance in doses of 7 or 8 grs. Nickel usually causes
vomiting, sooner or later, in doses above 2 or 3 grs. Chromium is

now under trial in the form of chromic chloride, and in all cases improvement has followed. Zinc was also experimented with and failed completely, but this is not to be wondered at, for it belongs to a different chemical group.—(Trans. Chir. Soc. I., 1869, p. 122.)

10. *Quinine.*—(α). *Effect on Temperature.*—Dr. Hamilton (*Indian Med. Gaz.*, Dec., 1870), made some observations on an officer, aged 40, who was the subject of ague, as to the effects of quinine. He found that quinine, in 5 to 10 gr. doses, averted the paroxysms and reduced the temperature by about 3°.—(*Lancet*, Jan. 14, 1871.)

(β). *Toxic Action.*—In the reports for February and August, 1870, and February, 1871, six cases were instanced in which an erythematous rash, succeeded by desquamation, followed the administration of *small* doses of quinine. Dr. W. Newman has met with a parallel case. A little time since he ordered *half a grain* of quinine as one of the components of an aperient pill for a lady. Half an hour after the dose was taken she felt some irritation about the head and face, which was followed by erysipelatous redness and œdema of the right side of the face, lasting for more than twelve hours. This lady had always been very susceptible to quinine, and all preparations of cinchona bark affected her more or less in the same way.—(*Brit. Med. Journ.*, April 8, 1871.)

(γ). *In Acute Lumbago.*—Dr. Glover directs attention to the value of quinine in acute lumbago and other acute pains in the back and neck. He gives 2 grs. every 4 or 6 hours.—(*Lancet*, February, 1870.)

11. *Santonin.*—(α). *Solution of.*—Dr. J. Harley recommends the following formula as a convenient mode of administration. ℞ santonin, in powder, gr. xij., sodæ bicarb. gr. xx., aquæ destill. ʒiij. Add the santonin gradually to the boiling alkaline solution and reduce by heat to ʒij. If desired, neutralize with acetic acid. —(*Practitioner*, Feb., 1871.)

(β). *Urticaria from.*—Dr. Sieveking recently prescribed for a child four years old, 3 grs. of santonin with 5 grs. of sugar, which were given to her in tea. Very soon afterwards, vomiting, accompanied by a severe form of erythematous rash set in, but soon disappeared. Next day, the dose was repeated, and almost directly after taking the medicine a white wheal, surrounded by a red blush, appeared on the nose, and a similar eruption rapidly covered the body. Violent vomiting set in, though without any pain or

purging, and the entire face became swollen. When Dr. Sieveking saw the child a quarter of an hour after the commencement of the symptoms, her face was scarcely to be recognized. The lips were enormously swollen, the nose was enlarged to the size of a Negro's, and the eyes were almost closed by the œdematous state of the lids. The intellect was unimpaired, and there were no spasmodic or other symptoms referable to the cerebro-spinal centres. The child was put in a warm bath, and within an hour the œdema and rash had nearly disappeared, and no further bad result followed. The santonin powders were examined by Mr. Squire and found to be pure.—(*Brit. Med. Journ.*, Feb. 18, 1871.)

12. *Carbolic Acid.*—(*α*). *Effects on Urine.*—In the two last reports several cases from different authorities were quoted illustrating the occasional peculiar action of carbolic acid on the urine. A case lately occurred in the Adelaide Hospital which confirms those observations. A woman, aged 48, suffering from a first attack of extensive *eczema rubrum* on the trunk and lower extremities, was ordered carbolic acid ointment for the body, and afterwards a carbolic and lead lotion for the legs. Three days after the application of the lotion the nurse showed me the patient's urine, which was dark olive-coloured, and nearly opaque by reflected light. On standing for a day or two it became much darker. With nitric acid it developed a sherry brown colour, but there was no trace of albumen. The absence of blood was shown by the guaiacum test. At the same time she complained of loss of appetite and of debility. The carbolic acid treatment was at once suspended, and all symptoms of its absorption speedily passed off. Again, an ulcer, resulting from *pemphigus gangrenosus* in a child four years of age, was dressed with carbolic ointment. In a few days the symptoms of strangury appeared, and the urine was turbid and of a greenish-yellow colour, becoming very much darker when heated with nitric acid. No precipitate on boiling, but it afforded some precipitate with M. Méhu's carbolic-test-solution for albumen.

(*β*). *Poisoning by.*—Accidents from the incautious or improper use of carbolic acid have unfortunately become sufficiently frequent to render necessary the greatest care in the dispensing and storing of this compound. Several cases were quoted in the two last reports, and the list could readily be extended. A man, aged 47, swallowed at least an ounce of crude carbolic acid by mistake.

He rapidly became comatose, never rallied to treatment, and died in a state of collapse 13½ hours after taking the poison (Dr. Ogston in *Brit. Med. Journ.*, Feb. 4, 1871). In April last, three girls, inmates of the Manchester Workhouse, at Crumpsall, were killed by having carbolic acid administered to them in mistake for cough mixture. The fatal blunder arose from keeping the carbolic acid in a cupboard along with other medicine bottles (*Pharm. Journ.*, May 6, 1871). A police officer took some carbolic acid from a bottle in mistake for a bottle of beer. He was at once removed to hospital, where he became insensible, and after lingering five hours died (*Pharm. Journ.*, Mar. 4). A sailor, searching for rum in his captain's cupboard, drank from the carbolic acid bottle instead which was similar in appearance to the rum bottle. When discovered he was comatose, with contracted pupils and intermittent pulse, and death occurred within three quarters of an hour.— (*Pharm. Journ.*, May 20.)

13. *Morphia.*—(α). *Prolonged Use of, Hypodermically.*—Dr. G. Oliver, though strongly in favour of this method, agrees with Dr. Allbutt (Cf. last report, Art. 8), as to the danger of setting up a " morphia habit," and he also recognizes the fact that the continued repetition of the injection does tend to perpetuate pain in certain cases, *e.g.*, obstinate *chronic* neuralgia. But in certain other cases, especially of visceral pain and irritation, morphia hypodermically, even for long periods, is the best means we have of giving rest and ease and favouring the restoration of health. He suggests that particular care should be taken in injection to avoid entering a vein and recommends that the needle of the syringe should be plunged in perpendicular to the surface and not in a slanting direction under the skin (*Practitioner*, Feb., 1871). Dr. Anstie, while confirming in the main the views expressed by Dr. C. Allbutt and Dr. Oliver, adds some further and valuable observations. He points out that there are three degrees of the action of morphia, hypodermically injected, which differ from each other in essential particulars. (1). That induced by small, purely stimulant doses, given only once or twice, or repeated once or twice daily for some time. (2). Somewhat larger doses, gradually reached and repeated with some frequency over a considerable period. (3). Large doses, repeated daily or oftener, requiring to be continually augmented, and often continued of necessity for years. Dr. Anstie details the special applications of each of these grades of morphia-action, and expresses

his conviction that there are only two kinds, even of incurable pain, which require a daily *large* dose, viz., pains produced by steadily progressive *ulcerative* processes involving nerves, or, by continuous and increasing *pressure* on nerves from a tumour. In most cases narcosis should be avoided as much as possible, and the purely tonic-stimulant action of morphia aimed at. In all cases, very small doses should be tried in the first instance.—(*Practitioner*, March, 1871.)

(β.) *Decomposition of Acetate of Morphia.*—It is well known that a solution of acetate of morphia is very prone to change; it soon acquires a yellowish-brown colour and deposits a brown matter. A crystalline deposit has also been observed, and Mr. John Maisch by careful examination of the crystals found that they were *pure morphia*, entirely free from acetic, carbonic, or other acid. The liquid which had deposited was neutral to test-paper, but acquired a reddish tint with pure perchloride of iron, which disappeared on the addition of muriatic acid. Acidulated with nitric acid, iodohydrargyrate of potassium occasioned a turbidity. Evidently a minute portion of acetate of morphia remained still in solution.—(*Pharm. Journ.*, Feb. 18, 1871; from *Amer. Journ. of Pharmacy.*)

(γ). *Antagonism of Morphia and Hydrocyanic Acid.*—Dr. J. Reese, as a first contribution to the subject of physiological antagonism, investigates this point, and the main result of his experiments seems to show that generally the symptoms of *both* poisons are clearly manifested, and that there is no real antagonism between these two toxic agents.—(*Amer. Journ. of Med. Sci.*, Jan., 1871.)

14. *Atropia.*—*Action on Birds* (*Pigeons*).—Dr. Weir Mitchell, and afterwards Dr. B. W. Richardson, had already shown that birds, viz., ducks, chickens, and pigeons, are remarkably insusceptible to the toxic action of opium, and Dr. Mitchell had incidentally mentioned that atropia, when dropped into the eye or given internally, has no visible effect on the pigeon's iris, except, in some profound poisonings, to cause a curious swift alternate contraction and dilatation within a very small range of movement (see reports for Aug., 1869, Art. 11, and Aug., 1870, Art. 23). Prof. H. C. Wood confirms positively the assertion originally made by Wharton Jones and repeated by Lemattre that atropia will not dilate the pupil of birds, although their irides are not destitute of radiating fibres. Neither a strong solution of atropia applied locally nor

belladonna given internally affected the pupil decidedly. Enormous doses of the solanaceous mydriatics are borne by pigeons, and belladonna, stramonium, and hyoscyamus resemble morphia in their want of action on these birds. It is almost impossible to immediately kill them with the extracts given by the mouth. In one experiment 48 grs. of the best English extract of belladonna were given in about seven hours without any appreciable narcotic effect. In another experiment, 3 grs. of pure sulphate of atropia were given and retained without producing inconvenience. Large doses of atropia, hypodermically, will prove fatal probably at least 2 grs. for an adult pigeon. As yet no experiments have been instituted on *carnivorous* birds.—(*Amer. Journ. of Med. Sci.*, Jan., 1871.)

15. *Theine.*—Mr. Lewis Thompson directs attention to theine as powerful tonic-stimulant with but slight action on the brain. He has used it in doses of 1 to 5 grs. with marked advantage in low typhoid fevers, confluent small-pox, and that form of mortification of the toes which is so fatal to old people. Others have found it useful in hemicrania neuralgia, and as an antidote to the narcotic effects of opium poisoning. The theine may be saved and collected during the roasting of coffee; 1lb. of raw coffee yielding about 75 grs. of theine. Theine is absolutely insoluble in concentrated solution of carbonate of potassium, and may thus be precipitated from its admixture with sugar, mucilage and vegetable extract. The following is a delicate colour-test:—Dissolve in water and pass in a stream of euchlorine (from hydrochloric acid and chlorate of potassium); evaporate to dryness and a red substance will remain which forms with water a beautiful scarlet solution (*Med. Times and Gaz.*, Feb. 18, 1871). Dr. O. Hammersten undertook some experiments under the guidance of Prof. Almin on the passage of theine into the urine. He shows that a small quantity of theine (3 cgrm. in 500 cc. urine) can be extracted by benzine from the solution acidulated with sulphuric acid, and then exhibits the violet colour re-action with fresh chlorine-water and ammonia as the result of two experiments, one on himself after taking 6 cgrm of theine, and the other on a person who drank two cups of strong tea (an infusion of 10 grm. of leaves), no theine could be detected in the urine. Wöhler and Frerichs had previously stated that theine does not pass off unaltered but is subsequently found in the urine as urea.—(*Med. Press and Circ.*, April 5, 1871.)

16. *Anæsthetics.*—(α). *Differential Use of.*—Dr. E. R. Squibb, of

Brooklyn, has recently published a pamphlet on this subject, being, in fact, a paper read before the Med. Soc. of the State of New York. From the title of the paper we might have expected a tolerably complete account of the various anæsthetics now in use or on their trial, yet Dr. Squibb speaks only of the three agents, viz., nitrous oxide, ether, and chloroform, and breaks no new ground on the general subject of anæsthesia. At one time chloroform was almost as exclusively used in America as in Great Britain, but within the past two years there has been a re-action in the former country in favour of the safer anæsthetics, and the primary object of Dr. Squibb's paper is to support the position that ethylic ether of specific gravity 0·728, yields the best and safest narcotic vapour, and is also the most applicable for general administration. There can be no question as to the greater safety of ether over chloroform, nevertheless the well-known practical objections to the use of the former remain, and in reference to these Dr. Squibb's book does not add much to our information. Though one to two fluid-ounces of ether for an adult man may suffice in skilful hands, yet, by Dr. Squibb's admission, it is not uncommon to see, even in the practice of large hospitals, four, six, and even eight fluid-ounces of ether used in the effort to get patients through the stages of intoxication, and a pound or more is not unfrequently consumed in a single operation, so that the surrounding air becomes charged with ether vapour. When, on the other hand, we consider the rapidity and certainty of effect of chloroform, and to these advantages add the facility and simplicity of its administration, the small quantity required, its non-inflammability, comparative cheapness, and its agreeable odour, we have indeed, as the author says, the key to its popular use, and the warrant for its preference to its more inconvenient rival, ether.

(β). *Chloroform.*—(1). *Internal Administration of.*—Dr. W. Murdock, New York, suggests the use of glycerine as a vehicle, and states that, by a little care, one part of chloroform by volume can be dissolved in three of glycerine. This solution is perfectly clear, bland to the taste, has but a slight odour of chloroform, and can be diluted to any extent without disturbing the solution. The chloroform must be added slowly and rubbed up carefully with the glycerine. Six ounces of glycerine and two of chloroform make seven ounces of the solution = 17 m. chloroform in one fluid drachm. (*Pharm. Journ.*, Oct. 15, 1870; from *Chicago Pharmacist.*)

(2). *Deaths from.*—It has been well argued by the late Sir J.

Simpson, that bearing in mind the inevitable accidents of surgery, it is not just to ascribe *all* deaths occurring during the administration of chloroform to the action of that agent itself (see Report, Aug., 1870, Art. 2). Still it cannot be denied that the number of fatal cases which have been lately recorded calls for most serious inquiry into this matter, and it is of the utmost importance that every fatal case of chloroform administration should be accurately reported. If it can be proved that the dangers attendant on the use of chloroform are inherent in the properties of that substance, do not belong merely to the method of its administration, we are bound to cast about for some safer anæsthetic; but if, on the other hand, we believe with Professor Lister, that deaths from chloroform are preventable accidents, the result of carelessness and the omission of the simple precaution of forcible traction of the tongue, we need not be over-anxious to reject an anæsthetic which has stood the test of twenty-five years' experience.—(*Brit. Med. Journ.*, April 29; May 27; June 24, 1871.)

(γ). *Bichloride of Methylene.*—(1). *Use of.*—Mr. C. Gaine, after considerable experience, is well satisfied with this anæsthetic, and has administered it in many capital operations. The shortest time in which anæsthesia was produced was 20 seconds, in a child aged six years; the longest was $2\frac{1}{2}$ minutes, in a man aged twenty-four. The shortest time during which anæsthesia was maintained was 40 seconds; the longest, 35 minutes. Recovery was always rapid and complete. About 40 minims should be sprinkled inside the inhaler, and it is important to exclude rather than admit air.—(*Med. Times and Gaz.*, Feb. 25, 1871.)

(2). *Death from.*—A third death has occurred during the administration of this substance in Charing Cross Hospital. One and a half drachms of the methylene were administered to a man, aged forty-one, about to have a finger removed on account of a severe injury. After the operation, which did not last more than one minute, it was found that life had become extinct and all efforts to restore animation proved useless. At the *post-mortem* examination nothing whatever was found to account for death.—(*Brit. Med. Journ.*, April 29, 1871.)

17.—*On the Principles of Therapeutics.*—Dr. James Ross endeavours to show that therapeutics is not destitute of principles, although principles are not to be confounded with scientific laws. The two great principles that we constantly observe or should

observe in daily life are—(1). To obtain the conditions which are necessary for the maintenance of life and health. (2). To avoid or remove the conditions which produce disease. Health may be negatively defined as the absence of disease, and disease as the presence of one or more of the recognized diseased states or processes enumerated in the published " Nomenclature " Therapeutics is an art and not a science; it is founded upon the union of several sciences for the attainment of a certain desirable end. He gives several illustrations of the first principle, and with regard to the second, points out that even when we are not able to affect the cause of disease as a whole, it is often possible to modify a link in the centre of the chain and thus to arrest, in whole or in part, the further effects of that link.—(*Practitioner*, April, 1871.)

18. *Mercury—(α). Theory of its Action.*—Dr. J. Ross ingeniously attempts to construct a theory which will reduce the various effects of the salts of mercury to some degree of order. He assumes it as probable that the salts of mercury after absorption assume the same form in the blood since their effects upon the system are very much the same. Mercury has an affinity for certain tracts of tissue, in especial, the white tissues of the body. It seems to affect by preference the joint ends of the long bones, serous membranes, certain parts of the true skin, and probably the sub-mucous tissue of the tonsils, fauces, and gums, and appears to seek an outlet mainly through the salivary glands, and mucous membrane of the alimentary canal, especially that of the rectum. He believes that the main effects of mercury on the body may be explained on the supposition that it tends to stimulate to increased activity the tissues already specified. Mercury is not a remedy for the generality of mucous membranes, just because it has no special affinity for them. Mercury is a hazardous remedy in the first stage of inflammation, for it may aggravate the disease. The action of mercury in syphilis is not at all comparable to the action of an alkali neutralizing an acid, or to that of an antidote to a poison, but is more analogous to the action of a spur in riding a horse (*Practitioner*, Oct., 1870). Dr. Murray thinks that the action and effects of calomel, *i.e.*, the mercurials, can, one and all, be referred to a series of processes which lead to a rapid passage of fluids through the various membranes of the body. It acts upon the absorbing and secreting surfaces, effects the *passage of fluids from the tissues into the blood through the walls of the blood-vessels*, and it

promotes, according to Dr. Murray, the passage of certain nutritive portions of the blood *through the walls of the blood-vessels into the tissues ;* in fact, its action is apparently that of facilitating osmosis. Hence calomel, as it really does, ought to cause absorption of material which is deposited in the tissues; it ought also to eliminate certain matters from the blood, and it ought to be a promoter of nutrition. In ptyalism the action of calomel on the bowel is checked, and its osmotic effects thrown upon other secreting organs, such as the salivary glands, but the kind of action, *i.e.*, the *direction* of the osmotic current is the same.—(*On the Physiological action of Medicines; Journ. of Anat. and Phys.*, May, 1867.)

(β). *Action on Liver.*—It is now more than two years since the well-known report of the Edinburgh Committee as to the action of mercury on the liver was published (see Report for August, 1869). The reporter, Dr. Hughes Bennett, considered that he had "demonstrated" (*sic.*) that mercurials in any form never occasioned (in dogs) the slightest increase in the amount of bile secreted. He has since made some further experiments to determine whether mercurials could have any effect in exciting the secretion of bile by local stimulation of the orifice of the common bile-duct, and has arrived at a distinctly negative conclusion (*Brit. Med. Journ.*, Jan. 7, 1871). In the *Edinburgh Med. Journ.* for April, 1871, Dr. T. R. Fraser contributes an able and interesting sketch of the present state of our knowledge respecting the action of mercury on the liver. Using the term *cholagogue* as implying a substance that increases the *evacuation or flow of bile*, Dr. Fraser points out that the modern doctrines of the nature of the action of mercury are resolvable into the four following, *i.e.* (1) That mercury simply increases the *flow* of bile into the intestines. (2) That it causes an increased *formation* of bile by removing abnormal interfering conditions. (3) That it causes an increased *formation* of bile by an indirect action on the liver. (4) That it causes an increased *formation* of bile by a direct and primary action on the liver. The experiments of Dr. H. Bennett and others may be looked on as embodying another doctrine, viz. :—That mercury has no cholagogue action whatever.

In reference to 1° the evidence proves almost to demonstration that mercury is able to restore to their normal condition alone, discharges modified so as to imply absence or diminution of bile, and can produce in them, as well as in normal dejections, characteristic appearances which are shown to be due to bile-constituents.

Hence mercury is distinctly a cholagogue although we cannot precisely explain *how* the increased flow of bile is effected. In reference to 2°, 3°, and 4°, which may be regarded as explanatory elaborations of 1°, we cannot offer direct proof, but there exists some evidence in their favour.

The great objection to the experiments of Dr. Scott and the Edinburgh Committee is, that they were performed in such a manner that *an action on the secreting activity of the liver-cells*—not on the flow of bile into the intestines—*could alone be examined.* Therefore it can never be shown by these experiments that mercury does not act as a cholagogue, and moreover, their researches only touch theories 2°, 3°, and 4°, and do not affect doctrine 2°, one of the most important from a practical aspect. Various physiological objections too can be urged touching the influence of the abnormal conditions present in their experiments. Their experiments are not at all conclusive in the negative, even as to the direct and indirect action of mercury on the formation of bile. Finally, " empiricism shows that mercury is beneficial in certain diseases, and that it acts in various conditions as a cholagogue, and we are not entitled to discard its use, because our knowledge of the mode of action, and of the pathological conditions in which it is indicated, is imperfect. . . . A therapeutical doctrine founded on plausible evidence, even when this is insufficient to establish it on a firm scientific basis, will, however, remain a proper, though unsatisfactory, guide for practice, so long as the reasons advanced against it are themselves inconclusive and unsatisfactory."

(γ). *Action in Children.*—Dr. W. Stephenson has been led by his experience to the following conclusions:—1. Mercury may be employed with perfect safety. 2. To obtain its therapeutic action, it is not necessary to produce its visible physiological effect; it becomes injurious as soon as these are manifested. 3. Its injurious effects are as readily produced as in adults, and are shown, not in its action on the mouth, but in its depressing influence and in deterioration of the blood. 4. It should be used only with the object of stimulating the nutritive changes of the tissues, and that as such it should be used only occasionally and at intervals. 5. Its use in modifying acute inflammatory action is very limited, but its power in resolving the *products* of inflammation is undoubted 6. No number of cases improperly treated by mercury, or other negative evidence, can invalidate the beneficial results of its judicious use.— (*Edinburgh Med. Journ.*, May, 1871.)

19. *Purgatives—Action of.*—The experiments of Hagentorn, Untiedt, Bastgen, and Daraszkiewitz, and Schaur, point to the general conclusion that the purgative action of the resins is due to a local irritation produced by these substances after their solution in bile. Dr. Köhler (Virchow's *Archiv.*) divides the irritant or drastic cathartics into classes, viz.:—1°. Those for which the action of bile is not essential *e.g.*, aloes, croton oil, senna, and rhubarb. 2°. Those for which it is requisite that bile should be present to act as a solvent, and to promote their diffusibility, comprising (α) those which, when dissolved, act as local irritants, *e.g.*, jalap, scammony, gamboge, and mushrooms; (β). the drastic cucurbitaceæ, *e.g.*, elaterium, colocynth, and bryony, in which there is not only a local action of dissolved resin, but also a secondary one on the nervous system after its absorption into the blood.—(*Lancet*, Nov. 15, 1870.)

20. *Diuretics*—(α). *What is a Diuretic?*—Dr. Milner Fothergill, calls attention to the loose manner in which the term " diuretic" is used, and points out that we are to distinguish between (*a*) agents that favour transudation of water from the kidneys by increasing blood-pressure, and (*b*) agents that act on the renal excreting cells and increase their activity. Thus, in the free flow of granular kidney, an agent of class (*b*) is required, *e.g.*, colchicum, juniper, potash or buchu. Some diuretics have a double action, *i.e.* act as a stimulus to the renal cells as well as a cardiac tonic, *e.g.*, squill (H. Fagge and Stevenson), belladonna (J. Harley), gin, &c. Alcohol, ether, and ammonia act by their general stimulant influence affecting the circulation. Digitalis is chiefly a diuretic in asthenic cardiac conditions, under which circumstances its action is sometimes magical.—(*Brit. Med. Journ.*, July 30, 1870.)

(β). *Experiments on the action of certain Diuretics.*—Dr. F. B. Nunneley has made some careful experiments on himself, with the object of ascertaining the influence of citrate and acetate of potassium, of Spir. Ætheris nitrosi, and of oil of juniper on the water, urea, and solids of the urine in health. His conclusions are, that in health—1°. Citrate and acetate of potassium only slightly increase the quantity of water excreted by the kidneys. 2°. They distinctly lessen the amount both of urea and of solids excreted. 3°. Spir. æther. nitr. slightly increases the amount of urinary water. 4°. It decidedly reduces the quantity both of urea and solids. 5°. Oil of juniper slightly reduces the amount of water excreted. 6°. It appreciably increases both the urea and solids.— (*Med. Chir. Trans.*, Vol. liii).

21. *Action of Alkalies within the Body.*—Mialhe and his followers maintained that alkalies are powerful oxidizing agents, which augment the excretion of urea and carbonic acid gas, and excite the circulation. But MM. Rabuteau and Constant (*Comptes Rendus, Juilet,* 1870), find from careful observations made on themselves and on patients that the bicarbonates of potassium and sodium invariably diminish the excretion of urea by 20 to 25 per cent., reduce the rate of pulsations, and lower the temperature; effects which go to prove that oxidation is diminished and not increased. These results strictly accord with general experience. They likewise explain how certain substances, such as acid fruits, act as refrigerants; for these fruits give rise to alkaline carbonates in the system, which lower the temperature by diminishing oxidation.— (*Jour. of Ant. and Phys.*, November, 1870.)

22. *Antiseptic Treatment.*—Mr. C. Macnamara, of Calcutta, while believing in the efficacy of the carbolic method of treatment, suggests a doubt as to the soundness of the germ-theory explanation of its effects. Perhaps the presence of the carbolic acid in the system, as indicated by the state of the urine, may have a share in influencing the healing process and in preventing the formation of pus. He also has noticed black urine from absorption of the acid, and recommends as a test for carbolic acid in urine to add twenty drops of strong nitric acid to about four ounces of the urine, when, within a short time, the urine will become of a deep brown colour. Boiling hastens the change. This colouration will appear even though the urine, before testing, may appear quite normal. It may be asked, is the occasional uncertainty attending the results of the carbolic acid treatment in any way due to the non-absorption of the acid into the system?—(*Practitioner*, Feb., 1871.)

23. *Sodium*—(α). *Bromide of.*—M. Decaisne finds that bromide of sodium is a perfect substitute for bromide of potassium in the treatment of epilepsy, chorea, &c.; and over it possesses the advantage of being more readily eliminated, and therefore more capable of being administered in large doses for a long period. Bromide of sodium frequently causes thirst and constipation, whereas bromide of potassium is apt to produce colic and diarrhœa.—(*Journ. of Anat. and Phys.*, Nov., 1870, from *Compt. Rend. Avril*, 1870.)

(β). *Sulphovinate of.*—M. Rabuteau states that this salt is the most pleasant of saline cathartics, and possesses all the advantages

of citrate of magnesium without its inconveniences. Ten grammes are always sufficient for children. Its taste is very mild at first and sweet afterwards, and there is no consecutive constipation.— (*Practitioner*, Nov., 1870; from *N. Y. Med. Gaz.*, July 23, 1870.)

24. *Vegetable Oils as preservatives from Malaria.*—Professor Mantegazza has made an interesting communication to the Lombard Institute of Science and Letters, and seems to have ascertained that flowers exhale large quantities of *ozone* superior to that obtained by phosphorus, electricity, or the decomposition of permanganate of potassium. For the most part the emanation takes place only under the direct action of the sunlight, and scarcely at all in the dark. In consequence of these experiments the cultivation of aromatic plants and the use of aromas is recommended particularly in marshy and malarious countries.—*Acamedy*, May 14, 1870.)

SPECIAL THERAPEUTICS.

25. *Conium and its use in Scrofula.*—Dr. Alexander Fleming, of Birmingham, has long been convinced of the value of hemlock in scrofula, and has particularly noticed its effects in favouring the absorption and removal of enlarged glands, and in promoting the healing of scrofulous sores. In those cases he gives it in conjunction with iodide or bromide of iron. As a local application it is often useful in allaying pain and itching of the skin, but it is well to remember that its external use requires caution. In the case of a child suffering from severe eczema, decided physiological effects ensued from the use of hemlock in the form of poultice, and caused some anxiety. Like many others, Dr. Fleming has felt the uncertainty and comparative inertness of the pharmacopœial preparations of hemlock, and for nearly twenty years has, from time to time, adopted the following mode of administration with good results. The fresh green fruit is mixed with its own weight of white sugar and reduced to a pulp. Five grains or more of this conserve, formed into a pill, are given three times in the day. Thus administered, the drug produces the usual physiological effects—slight dimness of sight, weakness and dragging of the lower limbs and languor—with much certainty. This preparation retains its activity for three or four weeks only, and has therefore to be constantly renewed.—(*Brit. Med. Journ.*, April 29, 1871.)

26. *Copaiba in Psoriasis.*—M. Hardy was the first to direct

attention about three years since to the use of copaiba in dealing with psoriasis. Dr. R. Liveing finds that in some obstinate cases the balsam succeeds where arsenic fails. In three cases Fowler's solution had been freely administered for many months, with decided improvement at first, but with subsequent retrogression, and with no improvement whatever for many weeks previous to the discontinuance of the arsenic. In two out of the three cases, the administration of the copaiba draught was followed by rapid disappearance, in about six weeks, of the psoriasis; and in the third case, it resulted in decided improvement though not in complete cure (*Brit. Med. Journ.*, Nov. 13, 1869). Dr. Simms is also in favour of the steady use of copaiba in obstinate cases of psoriasis, and is of opinion that copaiba, as a remedy, is best adapted for recent cases in young persons, with whom the specific eruption appeared quickly.—(*Lancet*, April 23, 1870.)

Dr. H. S. Purdon also believes that the treatment of psoriasis by copaiba, given with a little liquor potassæ, mucilage, and water, has been highly gratifying, especially in cases where it has produced extensive urticaria; indeed the dose should be increased till the latter is established.—(*Dublin Quart. Journ.*, May, 1871.)

27. *Ergotine in Hemoptysis.*—Several authors (Weber, Balfour), highly recommended the hypodermic injection of ergotine in hæmorrhages, especially in hemoptysis, and Dr. Allan Jamieson tried it lately with remarkably rapid effects. A man, subject to a cough for fifteen years, was seized with recurrent hemoptysis one morning after exposure to cold the day previously. The evening of the day the hæmorrhage occurred, Dr. Jamieson injected five grains of Messrs. T. and H. Smith's ergotine, dissolved in ten minims of distilled water, into the arm. Next day no more florid blood had come up, only one or two dark coagula. On the third day there was slight return of the hemoptysis, and on the fourth day, it was again considerable. The injection of ergotine was repeated and the expectoration of florid blood immediately ceased. In a few days he resumed his employment, in good health except for some moist rales at base of left lung. He continued well during the severe winter of 1870–71, but in May, the hemoptysis recurred, and again, after the injection of ergotine, the spitting up of florid blood immediately ceased. No evidence of phthisical disease of lung.—(*Brit. Med. Journ.*, June 3, 1871.)

28. *Iodide of Potassium*—(α). *In Tubercular Meningitis.*—Dr.

Alexander Fleming has long been satisfied of the inutility of mercurials in the treatment of this disease, and relies chiefly on iodide of potassium or ammonium, either singly or combined, in doses of one to three grains each, an hour before each meal. At the same time he employs aperients by the mouth and rectum, and blisters to the back of the neck and behind the ears.—(*Brit. Med. Journ.*, April 29, 1871.)

(β). *Purpura from.*—In the case of a man, aged fifty-eight, under the care of Dr. Bradbury, of Cambridge, iodide of potassium, administered for rheumatic pains, twice produced an eruption of purpura on the thighs, legs, and arms. When the drug was stopped for a fortnight, the purpura disappeared, and on its re-administration, the spots re-appeared again to disappear on the drug being suspended. Ricord and Virchow had previously observed this curious effect. The former had a syphilitic patient who, whenever he was treated with the salt, suffered from purpura hæmorrhagica. Virchow's case was one of cancer, the subject of which had purpura hæmorrhagica whenever the drug was administered. Dr. Bradbury's patient had also had several slight attacks of epistaxis.—(*Brit. Med. Journ.*, Feb. 4, 1871.)

29. *Mercury Hypodermically in Syphilis.*—This method, which was introduced by Scarenzio, of Pavia, in 1864, has been the object of numerous investigations in France and Germany, and has received some attention in England. Dr. R. W. Taylor, of New York, has conducted observations upon the treatment of syphilis by injections of corrosive sublimate for a period of eighteen months on about fifty patients, male and female. His final and general conclusion is that, while in some cases the treatment may be useful by reason of its rapid action and the smallness of the dose, the inconveniences which it produces, the objections of the patients, and the presence of lesions which contra-indicate its use, confine its sphere of usefulness to very narrow limits. A very minute quantity of mercury, averaging from one to three grains, thus administered, may cause the disappearance of very extensive syphilitic lesions, and the alleviation of very severe symptoms. Liability to relapses is not prevented.—(*N. Y. Med. Gaz.*)

30. *The action of Neurotic Medicines in Insanity.*—Under this title Dr. T. S. Clouston has reprinted from the *Brit. and For. Med. Chir. Rev.*, Oct., 1870, and Jan., 1871, a very elaborate and

exhaustive essay for which the Fothergillian Gold Medal was awarded by the Medical Society of London. The main object of the investigation was to inquire into the use of opium, bromide of potassium, and cannabis indica in maniacal insanity, especially in regard to the effects of the two latter drugs given separately. The observations consist of three parts. 1st. Experiments to determine the effect on maniacal excitement of single doses of certain medicines, stimulants, and food. 2nd. Experiments to determine the effect on maniacal excitement of prolonged courses of certain neurotic medicines. 3rd. An account of clinical observations and experience of the effects of the same medicines in all kinds of insanity. Only one or two of the more important conclusions from the author's numerous and careful experiments can be noticed here, but the whole pamphlet deserves and will well repay attentive perusal by all therapeutists, especially those engaged in lunacy practice. A combination of one drachm of bromide of potassium with ʒi. of tr. cann. ind. was found to exert more influence in allaying brain excitement than any of the other drugs or stimulants tried. It is more uniform and certain in its effects, more lasting, and interferes less with the appetite, and the dose does not require to be increased after long continued use in order to produce the same effect. Bromide of potassium alone can subdue the most violent maniacal excitement, but only when given in immense and dangerous quantities, and its effects are decidedly cumulative. When the two drugs are given together, the first symptoms developed are those of cannabis indica. Fewer cases of simple melancholia were benefited by the bromide, alone or along with Indian hemp than any other form of insanity.

CHLORAL.

Preparation.—Dr. E. R. Squibb, who has undertaken the manufacture of chloral in America, has made numerous experiments before he overcame the many difficulties attending the process. The apparatus for making chloral consists—first, in the means of generating chlorine; second, in the means of drying the chlorine; third, in the means of passing it into absolute alcohol without loss; and fourth, in having the alcohol in such a position that it can be gradually warmed. The process requires about 28 days for the current of chlorine to be passed into the alcohol. Sixteen gallons of absolute alcohol, yield 160 pounds of crude chloral, which, when purified, gives about 125 pounds of the pure compound. In regard to its

name Dr. Squibb proposes to call it simply chloral, not hydrate of chloral, nor chloral hydrate. He properly remarks that the latter terms are mere surplusage, for we do not usually recognize the presence of combined water in the names of chemical compounds. We do not say hydrate of sulphuric or of hydrochloric acid. A serious mistake in prescribing was nearly committed by abbreviating the words hydrate of chloral to " hyd. chlor.," but was corrected in time to avoid danger (*Pharm. Journ.*, May 13, 1871; from *Proc. Am. Ph. Assoc.*, 1870). It is stated that *ten tons* of chloral were imported into England last year from Germany, and that probably at least *fifty tons* in all have been sent out to England alone since August, 1869, corresponding to about 30,000,000 narcotic doses.— (Dr. Richardson).

Properties and Tests.—In a paper published in *Pharm. Journ.*, Jan. 7, 1871, Mr. A. H. Mason, related some experiments which seemed to show that the alcoholate of chloral was largely substituted for the hydrate in commerce, and that, out of nine samples, all were very deficient in their yield of chloroform, except three specimens which had been prepared under the supervision of Liebreich himself. But Dr. B. H. Paul, on the other hand, has examined a number of samples (12) by the " ammonia-test" of Mr. Umney (see last Report, Feb., 1871), and has arrived at results widely different, which go to show that there is no very great difference in commercial specimens as to their yield of chloroform, and in fact, Mr. Mason has since acknowledged the inaccuracy of his own experiments. The crystalline varieties almost invariably gave the largest amount of chloroform. None of the samples contained less than 87 per cent. of chloral hydrate (*Pharm. Journ.*, Feb. 4, 1871). Dr. Versmann points out that the different crystalline forms in which chloral is sold are, no doubt, due to the different solvents employed for re-crystallization. Thus, a concentrated aqueous solution placed under the air-pump, gives rhomboid crystals, ether gives small hard crystals, acetone fine needles, warm benzole supersaturated deposits on cooling also fine needles; whereas a solution in benzole, allowed gradually to evaporate, deposits large crystals, sometimes half an inch long. Bisulphide of carbon in the same manner yields either fine needles or large crystals. A saturated alcoholic solution gives beautiful long feathery crystals, even one and a half inches long, but they are the *alcoholate* not the hydrate of chloral. The hydrate is extremely hygroscopic, the more so the smaller the crystals are. The hydrate is extremely soluble in

water, 100 parts of water dissolve as much as 360 parts of the dry crystals; the alcoholate is much less soluble in water, and, in fact, the two may be readily distinguished by the difference in behaviour of a crystal or two dropped into a tumblerful of water. The specific gravity also of the solution of the hydrate is considerably higher than that of the alcoholate for equal strengths. Dr. Versmann does not attach any value to the boiling point as a test of purity, as it is sometimes extremely difficult to take correct observations, for at the boiling temperature both hydrate and alcoholate begin to decompose into chloral and water or alcohol respectively. Mr. Wood, on the contrary, believes the boiling point to be a very important character of chloral hydrate. For the direct detection of *alcohol* in chloral Lieben's test is the best which depends on the conversion of alcohol into the crystalline precipitate, iodoform, on adding a little iodine and excess of liquor potassæ (or sodæ.)—(See *Pharm. Journ.*, Feb. 25, 1871.)

In estimating the quality of chloral by the "ammonia-test," *i.e.*, by the amount of chloroform set free, the drawbacks are, the length of time (12 hours) required, and the decrease in the percentage of chloroform owing to its solubility in water. To obviate these two new processes are proposed. Dr. Versmann (*Ph. Journ.*, Mar. 4, and June 3, 1871), takes advantage of the facility with which both chloral hydrate and alcoholate are decomposed by strong sulphuric acid with separation of chloral, which may be read off in a graduated tube, and the percentage of hydrate calculated. Into a graduated tube closed with a well-ground stopper introduce five to six c.c. of sulphuric acid, and heat it by placing the tube in a vessel of water at about 60° C (140° F); then add 10 gms. of chloral hydrate, shake well, and re-immerse in the hot water. The decomposition is *instantaneous*, and the chloral floating on the top (sp. gr. 1·5 at 15·5° C) may be read off as soon as the tube has cooled down to the proper temperature. After an hour or so the two liquids begin to mix again, and in about twelve hours the chloral is changed into metachloral, a solid body, isomeric with chloral, but absolutely insoluble in water and alcohol. Comparative trials with this method and the ammonia-test give slightly higher results than the latter, which are not so correct.

Mr. H. C. Wood (*Pharm. Journ.*, Mar. 4, 1871), also objects to the ammonia-process, and proposes the following method, which is based on the liberation of the chloroform by lime, and the collection of the evolved chloroform by distillation. 100 grs. of the

chloral hydrate are introduced into a 4 oz. flask and dissolved in an ounce of water.   30 grs. of *dry* hydrate of lime are added, and the exit pipe, which is surrounded with wet blotting-paper, is made to enter a graduated tube which serves as a receiver.   By a gentle heat the chloroform slowly distils over, and the mixture is boiled for a short time until about 100 grain-measures have been collected in the receiver.   It is now only necessary to read off the volume of chloroform obtained, at 60° F, and the whole process does not occupy a quarter of an hour.   Mr. Wood has not found the alcoholate to be an article of commerce.   As simple tests for the purity of chloral, Mr. Wood recommends the following:—1. A small portion heated on platinum foil should entirely volatilize. 2. Twenty grains dissolved in a drachm of distilled water should form a perfectly bright and clear liquid.   A drop of nitrate of silver solution should cause no turbidity.   3. A drachm introduced into a test-tube furnished with a cork, through which pass a thermometer, and a small exit tube should boil without the temperature rising above 212° F.

We have now before us three methods for the quantitative estimation of chloral hydrate, and experience must determine which is the best. (*a*) The " ammonia-process" of Mr. Williams and Mr. Umney, somewhat tedious in execution and not precisely accurate. (*b*) The " sulphuric acid-test" of Dr. Versmann, instantaneous, and claiming to be accurate; and (*c*) the " lime-process" of Mr. Wood, which appears to be well conceived and easy to perform.

Modes of Administration.—Mr. H. P. Reynolds finds that emulsion of sweet almonds is a very satisfactory vehicle for chloral, and mitigates greatly its pungent flavour.   Syrup of gum flavoured with orange-flower water, and essential oil of almonds is also a very agreeable excipient for chloral (*Amer. Journ. of Ph.*)   Dr. Squibb (*loc. cit.*) points out that chloral is very liable to decomposition from contact with organic matter, and recommends that chloral should be kept as free as possible from all organic matter.   If dispensed in simple watery solution in glass-stopped bottles, it keeps indefinitely, and can be added to any desired vehicle at the time of taking.   It is not equally liable to decomposition from all kinds of organic matter, and even the same kind of organic matter does not always produce the same effect with the same chloral.   For example, with syrup of orange-peel, decomposition, with the production of hydrochloric acid, will sometimes commence in a day or two, and

sometimes not for weeks, though the apparent conditions be the same. When chloral affects patients unfavourably, it should always be examined by smelling and tasting and by litmus paper.

Physiological Effects.—Dr. B. W. Richardson, in speaking of the dangers attendant on the administration of chloral, proposes and answers four questions—1°. Is the practice of resorting to chloral as a narcotic in the absence of medical advice and direction becoming a common practice among the people? The answer to this must be strictly affirmative. Three classes of persons are becoming addicted to chloral-drinking, viz.—alcohol-devotees, sufferers from neuralgia and other painful chronic diseases, and persons having much mental worry, grief, or care. 2°. What is a dangerous and what is a fatal single dose of chloral? The largest non-fatal dose of which he was cognizant is 120 grs. 180 grs. may be considered a dose which, in the majority of cases, would prove fatal. (In the last report, Feb., 1871, two cases were quoted in which over 400 grs. had been taken without a fatal result, W. G. S.) 3°. What quantity of chloral may be given with safety in divided doses during the twenty-four hours? The body cannot decompose and throw off chloral more rapidly than at the rate of 5 to 7 grs. an hour, and consequently 120 grs. administered, even in divided doses during twenty-four hours, would be the safe limit of exhibition. 4°. Does the frequent administration of chloral lessen or increase the dangers of the administration? It appears that it does increase the danger from an excessive dose, and in this respect it differs from opium.—(*Med. Times and Gaz.*, Feb. 11, 1871.)

Mr. Monckton has been led by his own observations to concur in the apprehension entertained by Dr. Playfair, that in a certain case of *puerperal convulsions*, chloral, though acting admirably at first, eventually contributed to the fatal result, and he suggests inquiry, how far and under what circumstances does chloral possibly become a blood-poison? (*Lancet,* Feb. 11, 1871). Dr. Crichton Browne, director of the W. Riding Asylum, indicates some dangers which beset the administration of chloral, especially when the nervous system is weak or disordered. He has frequently observed a singular tendency to flushing of the head and face, generally occurring, not after a single dose, but where the drug had been taken regularly for some little time. The combination of chloral with alcohol in any form rendered its occurrence much more certain. In one case a few doses of chloral brought on a sharp attack of

urticaria from which the patient had never previously suffered.—(*Lancet*, April 1, 1871.)

Dr. Winter Fisher has also observed the occurrence of urticaria after a dose of chloral. A stout middle-aged woman, after taking 25 grs. of chloral, became extensively affected with urticaria. No unwholesome article of diet had previously been partaken of. The chloral was at once discontinued, but twenty-six days afterwards, a similar eruption supervened after a dose of 10 grs.—(*Brit. Med. Journ.*, April 1, 1871.)

Poisoning by.—In the last two reports the occasional ill-effects following on moderate doses, and the alarming symptoms resulting from enormous doses were exemplified by several cases, while one fatal case was recorded by Mr. J. F. Brown. Within a short period *at least six deaths* have happened under the use of chloral, and it is high time to awake to a sense of its powers for harm as well as for good.

A woman, aged forty-six, under the care of Mr. Hugh Norris, was addicted to excessive drinking for the past seven years. For months previous to her decease, chloral was administered almost nightly, no single dose exceeding 40 grs. The chloral was discontinued for some time, though it did not appear in any way to injure her health, but, on the 3rd of Jan. 1871, it was resumed and given, as a rule, twice a day, about 10 grs. in the morning and 30 to 40 grs. in the evening. She spent a restless night on Jan. 11th, but, after three chloral draughts, got some broken sleep, and awoke in the morning and eat her breakfast. About noon she was seized with vomiting and suddenly died. It turned out that she had secretly taken an additional quantity of chloral, making a total of 712 grs. within nine days, the last 260 grs. of which had been taken within 35 hours. *Post-mortem*, 100 hours after death. No odour of decomposition from the tissues; no perceptible odour of chloroform; liver much enlarged. Mr. Stoddart, of Bristol, analysed the contents of the stomach and portions of lung, liver, heart, kidney, and spleen, and on distilling parts of the contents of the stomach with caustic soda, and passing the vapour through a red-hot tube, Cl. and Hcl. were produced and readily detected, proving the development of chloroform. Free chloroform was recovered from another portion by distillation. There was no smell of chloroform till after the addition of an alkali. Chloroform was also separated from the liver, but not from the other organs.—(*Lancet*, Feb. 18, 1871.)

In the *N. Y. Journ. of Psych. Med.*, Jan., 1871, Dr. Needham records a case of fatal cerebral congestion favoured or induced by repeated doses of chloral. A nervous lady, who had been subjected to a great variety of treatment without avail, was finally given chloral in cumulative doses, six in all, of 30 grs. each. Profound sleep ensued, and in spite of every attempt to rouse her, she sank into coma and died. The cerebral vessels were found to be enormously congested. Bromide of potassium had been taken for some time before. In one of the London hospitals a fatal issue also followed the exhibition of a large dose of chloral to a patient in a state of exhaustion, the result of a severe operation.—(*Med. Times and Gaz.*, Feb. 4, 1871.)

Messrs. W. Hunt and R. Watkins report a fatal case in the *Brit. Med. Journ.*, Feb. 25, 1871. A clergyman, aged fifty-one, subject to dyspepsia, and in the habit of doctoring himself, commenced taking chloral at night on Nov. 15th, 1870; at first 20 grs. with 20 grs. bromide of potassium. The dose was gradually increased, but to what extent, and how rapidly, is uncertain; and the bromide was omitted. He was cautioned against taking an overdose, and though on one occasion, after taking three doses in one night, he was partially paralyzed in the lower extremities in the morning, he obtained from a firm a box containing 16 ounce-bottles of chloral, half of which he intended sending to a relative.

On Friday, Jan. 27, 1871, he was found by his house-keeper, at 8.30 a.m., dead in bed, the left arm being placed over the top of the head. When Mr. Hunt saw him, about 9 a.m., the face was pale and perfectly calm, covered with perspiration, and with no appearance of any struggle having occurred. No sign of vomiting. The house-keeper had seen him take a dose of chloral the night before his death, but the quantity was not known. At the *post-mortem* examination, no abnormal appearances were found in the heart, lungs, or abdomen. The membranes of the brain were congested, but the convolutions were pale and very soft. No increased vascularity, nor effusion into the ventricles.

Dr. Fuller ordered 30 grs. of chloral to a man suffering from chronic, Bright's disease. Soon after taking it he jumped up in bed, clutched at his heart, became violently delirious and afterwards sank into extreme depression, but fortunately recovered in a few hours. A second similar dose combined with a full dose of acid was followed by the same series of symptoms. In another case, a young lady, aged twenty, previously in fair health, but of a

hysterical temperament, was given 30 grs. of chloral at 10 p.m. Almost immediately she became excited, fell asleep in an hour and slept heavily all night. Next morning she was cold, pulseless, and could not be roused even under the use of suitable measures, such as brandy, diffusible stimulants, enemata, &c., and next morning she sank without having exhibited the slightest consciousness or moved a muscle from the time she fell asleep. Other observers, Dr. Tuke, and Mr. F. Webb, have met with analogous, though happily not fatal, cases.—(*Lancet*, Mar. 25, 1871.)

In the *Lancet* of April 1st, two additional deaths from an overdose of chloral are mentioned, viz.: Mr. Meldola, surgeon, and Mr. E. C. Smallmann, also a surgeon.

Therapeutic Uses.—Little or no additional information of importance has been contributed during the past six months, and only one or two points will be alluded to here. Experience of its use in *tetanus*, on the whole, has not been favourable, and its failures have been more conspicuous than its successes. Mr. Nankivell gives a case of traumatic tetanus treated from the first with chloral, but which terminated fatally on the eleventh day. The chloral produced sleep, but nevertheless the spasms increased in severity. In another case of trismus in a boy, the spasms did not cease, even when the patient was under the influence of the chloral.— (*Med. Times and Gaz.*, March 4, 1871.)

In *lunacy practice*, the general experience has been highly in its favour. Dr. N. G. Mercer has largely employed chloral as a hypnotic in cases of mania, suicidal hysteria, and general paralysis, and finds that—(1.) In very many bad cases of noisy habits during night it is a powerful and efficient hypnotic, and more certain than an opiate. (2.) It does not lose its potency by repetition. (3.) In some intractable cases of intense maniacal excitement it seems to be of less service than opiates (*Med. Times and Gaz.*, April 22, 1871). Lastly, in *incontinence of urine*, Dr. W. Thomson has recorded two cases of long duration which were *rapidly* cured by chloral (*Lancet*, Nov. 19, 1870), and Dr. Bradbury has met with similar success. Dr. Bradbury also recommends it, and has been successful in the treatment of nocturnal *incontinence of semen*. In both these affections he considers chloral to possess marked advantages over belladonna.— (*Brit. Med. Journ.*, April 8, 1871.)

PART IV.

MEDICAL MISCELLANY.

————◆————

Reports, Translations, and Scientific Intelligence.

————◆————

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF DUBLIN.

Dr. J. Stannus Hughes, President.

Atheroma and Calcification of Aorta, with Hypertrophy of Left Ventricle.—
Professor Law exhibited a specimen of extensive atheromatous deposit
and calcification of the ascending portion of the arch of the aorta, with
moderate dilatation, and great hypertrophy of the left ventricle of the
heart. The subject of the case was a man, aged forty, who had been a
soldier in India for twenty years. On his coming to Ireland, he became
a labourer, and engaged in very hard work, which consisted chiefly in
carrying heavy loads. On one occasion, when thus employed, he felt as
if something gave way in his back, and from that day he dated the failure
of his health. He felt distress in his chest and epigastrium ; had violent
palpitation of the heart, and his legs swelled. For these complaints he
went into different hospitals, and obtained temporary slight relief. When
Dr. Law saw him, in Sir Patrick Dun's Hospital, he presented the follow-
ing symptoms :—Strong action of the heart, with impulse ; a loud double
murmur behind the upper bone of the sternum ; jerking, collapsing pulse,
visible at the wrist. He complained of great distress in his chest, and of
oppression of his breathing. The murmur heard behind the sternum was
propagated into the large arteries ; he had some swelling of the legs.
During the two months he was under Dr. Law's care his symptoms did
not undergo any material change, except that he occasionally felt more
distress than at other times, so as to lead to the suspicion of the existence
of aneurism ; but these pains were very occasional. Once or twice he
said he had some distress in swallowing. The murmur behind the
sternum was sometimes louder and more rough than at other times ; and
at times he seemed pretty well, and made but little complaint. At the
end of two months he left the hospital, but returned at the end of ten
days, in great suffering, from oppressed breathing and pain through his

chest, which he especially referred to the left side, under the nipple; he had profuse hæmoptysis; the pulse was very weak; it had quite lost the jerking character which it had before; the heart's action was feeble, and the double murmur was no longer to be heard behind the sternum; there was extreme dulness on percussion in the inferior portion of the left side of the chest, both anteriorly and posteriorly, where no respiration was to be heard, and here it was that he felt the pain of which he complained so much; the hæmoptysis continued profuse; nothing could relieve it. He sank rapidly.

The specimen was remarkable for the great extent of atheromatous degeneration and calcification of a considerable portion of the thoracic aorta, although most marked in the ascending portion, which, was also somewhat dilated, but not to any great extent. The left ventricle was very much hypertrophied, but the capacity of its chamber was not increased. The upper lobe of each lung was emphysematous; the lower lobe of the right was congested, while the lower lobe of the left was the seat of apoplexy; it was, in fact, full of extravasated blood.

Dr. Law considered the case to have a good deal of interest, more especially from the resemblance which its symptoms bore to those of aortic valve disease. It was Dr. Bellingham who first directed attention to there being a great similarity between the signs of aortic valve disease and those of an atheromatous, and sometimes dilated condition of the arch of the aorta, and had pointed out some signs by which the two lesions might be distinguished. While both had the peculiar thrill, or arterial *fremissement*, with the same jarring, jerking pulse, visible at the wrist, and with the double murmur behind the sternum, and this murmur propagated into the arteries, there was this difference, that in the case of aortic valve disease, the double murmur is heard in the direction of the vertical axis of the organ, while in the case of the atheromatous aorta it is heard at the top of the sternum, and in a transverse direction.   Dr. Bellingham gave a different explanation of the double murmur from that which had usually been given; while he agreed with others that the first sound was due to the blood passing over the rough arterial surface, he did not consider the second sound to be owing to the blood regurgitating into the ventricle, in consequence of the valves not meeting, from their not keeping pace in growth with the dilated artery, but that it is owing to the backward passage of a current of blood over the roughened arterial surface from the arterial branches that arise from the transverse portion of the arch: for that when the ventricular systole ceases, the artery, owing to the rigid inelastic state of its coats, is incapable of contracting on its contents, and a partial vacuum would be created, were it not that the blood from these arteries comes to occupy it.

Dr. Law regarded the hypertrophy of the left ventricle of the heart as compensatory, as observed by Douglas, who remarks—"That a diseased

state of the arteries destroying their elasticity, the circulation is to that extent obstructed; and the left ventricle, under the additional burden, undergoes hypertrophy to compensate for the lost tonicity of the arteries."

Dr. Law adverted to the difference of opinion that existed among pathologists whether atheroma originated in arteritis, or was a degeneration that had not gone through other phases.   He remarked that pulmonary apoplexy was rarely met with in connexion with this lesion, or with the cardiac lesion that it so much resembled, however frequent it was in mitral valve disease.   There had been a specimen of aortic valve disease exhibited before the Society, in which death resulted from pulmonary apoplexy, with profuse hæmoptysis.—*April 9th*, 1870.

Cystic Tumours.—Dr. T. E. Little said he wished to bring under notice three specimens of cystic tumour, each of which possessed some feature of interest.

1. *Cystic Tumour of the Breast.*—The first specimen was a mammary tumour, taken from the breast of a married woman of the age of forty, who had never had a child, and had always enjoyed excellent health.   The patient stated that from the age of puberty she had observed a small nodule in the site of the tumour, which, however, had never given her the least inconvenience or uneasiness, or undergone any change, until about nine months ago, when, after an accidental blow, it began to enlarge and became the seat of pain.

The tumour was situated at the upper and inner part of the breast, and, though freely movable upon all the surrounding parts, was clearly connected with the gland.   It was composed of a single cyst, of about the size of a cricket-ball, with several small loculi projecting from its surface. The cyst-wall was composed of condensed fibro-cellular tissue, and in part of the gland structure, it varied in thickness, being much thinned in some of the more superficial parts.   It was to the peculiarities of the contents of the cyst (Dr. Little said) that he more especially wished to direct attention.   It was tensely distended by a pale, translucent fluid, which, under the microscope, yielded appearances exactly reproducing those met with in puerperal milk.   There appeared numerous oil globules of a more regularly spherical shape, and of more uniform size than those ordinarily met with in accidental oily mixtures, and more particularly a host of large spherical corpuscles full of small brilliant globules, presenting the exact appearances of the so-called colostric corpuscles.   For the sake of comparison, some milk from the breast of a woman two days after delivery, was obtained, and, except in the matter of comparative dilution, the appearances observed seemed to be identical.   The interest and importance of this observation, rested with the fact that it seemed to throw a light on the genesis of the tumour, in the determination of which the mere anatomical examination could not give much information.   It

suggested the probability that it had originated as a dilatation of one of the lactiferous ducts.

2. *Cystic Tumour of the Testicle.*—The second specimen was a cyst connected with the testicle. It was taken from the body of an old man, admitted into hospital for a large acute abscess of the scrotum. Some hours after admission the patient died rather suddenly and unaccountably.

On examination a large abscess was found in the front of the scrotum. Lying behind it was what appeared to be the testicle much enlarged. A vertical section through the posterior part of this mass exhibited with striking distinctness the anatomical relations of the normal and abnormal structures concerned. The incision had opened up a large cystic tumour situated above, and a little to the front of the testicle. The gland itself pressed downwards and somewhat flattened, though obviously atrophied, presented sufficient distinctness of structure to show that it had no primary connexion with the tumour. The corpus highmorianum, the septa, and the glandular tissue, could be plainly discriminated. The tunica albuginea could be traced continuously round the testicle, and was nowhere carried over the tumour ; which thus, though presenting the characters usually implied under the title " hydrocele of the testis," was, strictly speaking, extra-testicular. The cavity of the tunica vaginalis was obliterated, except for a small space in the upper part, and its visceral layer generally much thickened. The epididymis (which the section had traversed), and the vas deferens were quite regular, and had no connexion with the tumour. As to the tumour itself, it could be plainly seen to hold its anatomical situation between the tunica albuginea, and the visceral layer of the tunica vaginalis. It had a proper wall of some thickness, which was soft and friable, and very rugose on its inner aspect ; no epithelial lining membrane could be made out, and, examined microscopically, it presented appearances which most closely resembled those of an artery in a condition of atheromatous degeneration. In the midst of a mass of irregular fibres, with a considerable amount of elastic fibre, were found numerous oil globules, and hosts of cholesterin plates. In several places small calcareous masses were to be observed, and in the upper part an apoplectic condition of the softened structure existed. At the anterior part of the tumour a small valvular perforation was to be observed where the wall appeared thinned, and most adhereut to surrounding the textures, through which the fluid contained could be squeezed. It might have some significance that the situation of this opening corresponded to the relative position to the tumour of the scrotal abscess. It is possible that the absorption of the cyst-wall, and consequent escape of the contained fluid was the exciting cause of the abscess. The patient could assign no accidental cause for its occurrence, and it did not seem probable that the fluids of such tumours would possess the bland and innocuous properties of the contents of an ordinary vaginal hydrocele. The fluid

contained was of a brownish colour, non-translucent.   On examination it was found to contain quantities of deformed blood corpuscles, broken down pieces of the cell wall, oily globules of various sizes, and a great abundance of cholesterin.   This last element was plainly visible to the naked eye.   No spermatozoa could be detected.

The characters of the tumour evidently indicated great antiquity, and the few facts in reference to its clinical history, necessary to allude to, pointed in the same direction. The patient said that he had observed the testicle concerned to have been from early youth somewhat larger than the other, and that it had been unfortunate in having been frequently hurt, more particularly eighteen years ago, in a contest at single-stick, when he received a severe blow upon the part, which laid him up in bed for some time, and the result of which was some considerable and permanent increased enlargement.   About a fortnight before death, without assignable cause, the scrotal abscess commenced to form.

Both the history and the result of the examination of the parts seemed to lend probability to the idea that the tumour had originated in a hæmatocele of the testis.

3 *Dermoid Setigerous Cyst.*—The third specimen consisted of a small cystic tumour, removed from the eyebrow of a young girl.

Its contents were of the usual pap-like material, composed of epithelial cells, fatty matter, and cholesterin, in addition to which were present numerous small and delicate hairs.   On looking at the inner surface of the cyst there were seen growing from genuine follicles in its wall several hairs of similar character.—*December* 17*th*, 1870.

Molluscum Simplex.—Dr. Purser said the specimens which he now exhibited were portions of skin taken from a patient who suffered from the disease known as molluscum simplex, or fibroma molluscum.   The patient was an exceedingly old woman, of whose history no accurate information could be obtained.   She had suffered from this disease for a great number of years, but for a considerable time before her death it had made no perceptible progress.   She died during the last summer, apparently of old age, in the Dungarvan Workhouse, and to Dr. Hunt, physician to that institution, Dr. Purser was indebted for an opportunity of seeing her before her death, and for the possession of the specimens which he now exhibited.

The skin of the patient was everywhere occupied by tumours, which varied in size from that of the head of a large pin to that of a small apple; the greater number were about the size of peas.   They were most numerous on the trunk; pretty abundant on the face, neck, and upper extremities, but much fewer on the lower limbs; thus agreeing in their distribution with the tumours in the case described and figured by Virchow in the first volume of his work on *Oukology*.   The tumours

were soft, freely movable with the skin to which they were attached, and which was smooth over them. They were free from pain of tenderness. The smaller tumours were sessile, the larger pendulous.

On *post-mortem* examination the tumours were seen to form well defined spherical masses, growing from the deeper layer of the corium. They were composed of a soft, juicy, yellowish tissue, to the naked eye somewhat resembling fat. On microscopic examination they were found to be composed of fibrous tissue, more or less perfectly developed. They were covered by the papillary layer of the skin and by the epidermis in the mucous layer of which there was more pigment than exists under ordinary circumstances. They were everywhere separated from the adjacent parts by the subcutaneous cellular tissue, and were evidently developed from the fibrous tissue of the true skin. Spindle formed cells were abundantly mixed with the fibrous tissue, but were nowhere so numerous as to give the tissue a sarcomatous character. Some of the smaller tumours were composed in great part of granulation tissue developing into fibrous tissue. The tumours were scantily supplied with vessels. Those in the larger tumours were wide, thin-walled, and ran a straight, slightly branching, course.—*December 17th*, 1870.

Cerebro-Meningeal Congestion.—Dr. HAYDEN submitted to the Society the viscera of a man who had died of cerebro-meningeal congestion simulating uræmic poisoning.

The man was a labourer, aged about forty-five, of temperate habits, and had enjoyed good health till about three months anterior to the date of his admittance into the hospital, when he began to suffer from severe but intermittent headache. During the last three weeks of this period the headache was continuous, and his manner was noticed to be odd and incoherent.

When admitted into the Mater Misericordiæ Hospital on the 15th of December, 1870, he was in a state of incomplete coma. In the afternoon he became violent, got out of bed, and attempted to force his way through one of the windows of the ward.

The following morning (16th), when first seen by Dr. Hayden, his condition was the following:—He lay in a drowsy state, and apparently quite unconscious; but when spoken to in a loud voice he answered, but incorrectly, questions having reference to his health; protruded his tongue (which was moist) when requested to do so, and swallowed liquid poured into his mouth without difficulty. Pulse slow (60), but regular and full; respiration tranquil; right pupil contracted, left invisible owing to vascularity and opacity of the cornea. Muscles of anus rigidly contracted. No paralysis. Urine 1·018 sp. g.; contained a trace of albumen. He frequently got out of bed in a state of unconsciousness.

For several days his condition underwent no change; but the urine,

which it was necessary to remove instrumentally twice daily, was of normal specific gravity, and after the first day entirely free from albumen.

About a week subsequent to admittance he was found at the morning visit partially convulsed ; the arms were rigidly and tonically contracted. He lay over upon his face, and gnawed the bed clothes with his teeth. The superficial veins of the scalp were engorged, and no answer could be obtained to questions addressed to him.

The head was now shaved and vesicated, and on the following day his condition was much improved. He now answered questions collectedly ; turned without assistance in bed ; took his drink, and was free from spasm. He continued, however, to pass his evacuations in bed, and the left cornea had now passed into a state of slough. Without having undergone any apparent change for the worse, he suddenly died on the 3rd of January.

The heart presented a considerable deposit of fat upon the surface, but was otherwise normal. Both the right and the left ventricle contained each a large thrombus composed mainly of fibrine, which extended into the pulmonary artery and the aorta, and in the former extensively into its branches also. The muscular substance of the heart, the lungs, and kidneys were healthy. The dura mater was closely attached to the calvarium. The pia mater and its inflections deeply injected, so that the surface of the encephalon and the sulci presented an almost uniform pink tint ; white substance on section thickly dotted with red points ; trigeminal nerve of left side soft and almost diffluent. Brain substance otherwise unaltered and free from extravasated blood.

In this case the diagnosis of meningeal and cerebro-cinereal irritation was made, partly from the character of the symptoms—tonic spasm of the limbs, contraction of the pupil, engorgement of the superficial veins of the scalp, and partial loss of consciousness, aided, no doubt, by the negative evidence afforded by the urine, which was carefully examined from day to day by one of the resident pupils of the hospital. The sloughing of the cornea is of interest in connexion with the softened state of the corresponding fifth nerve. The immediate cause of death was, I doubt not, cardiac thrombosis.—*January* 14*th*, 1871.

Encephaloid Tumour of the Hand.—Mr. Porter exhibited the hand and a portion of the right fore-arm of a patient of his in the Meath Hospital, on whom he had performed " Wharton's " modification of " Teale's " amputation of the fore-arm for malignant disease of the hand. The patient was a married woman, aged twenty-four years. Eight months previously she observed a small kernel in the centre of the palm of her right hand ; at that time it gave her no pain, but she constantly felt great itching in the tumour. The growth steadily increased in size, and the itching soon gave way to the feeling of numbness of the whole hand.

About three months after the first appearance of the swelling, a gnawing pain commenced, and increased in intensity until the removal of the disease—on many occasions so severe that her sleep was prevented. She was greatly emaciated and very feeble; but there were no enlarged glands in the axilla. A section of the tumour showed a marked example of encephaloid cancer. A mass the size of a small orange, of brain-like structure, with vascular spots, and blood-clots interspersed, occupied the palm of the hand; the bones were not invaded.

Mr. Porter observed that although that species of cancer called epithelioma was frequently met with on the dorsum of the hand in advanced life, the form of malignant disease now exhibited was not very often found invading the palm of the hand.—*January 14th*, 1871.

Aortic-valve Disease—Embolism.—Dr. Grimshaw exhibited the brain and heart of a man, aged thirty-three years, who was admitted into Steevens's Hospital on December 29th, 1870, and died January 1st, 1871. He was discharged from the army for " heart disease," and had been in Steevens's Hospital two years and a-half ago, suffering from vertigo, palpitation of the heart, and shortness of breath. He stated that he had rheumatic fever eleven years ago. On examination the pulse was found collapsing, but not markedly so. The sphygmogram was as shown in the woodcut, and of the character found in aortic patency, but without

the characteristic link at the apex. The area of cardiac dulness was enlarged, and the first sound impulse increased. There was a single direct murmur over the aorta. The diagnosis was—slight aortic patency, with diseased valves.

On his second admission into hospital on December 29th, 1870, the account given by his friends was that he had been sitting by the fire in his own home; fell off the seat; was unable to speak or rise; was lifted up by his friends and brought to hospital, where, on examination, he was found to be completely paralysed on the left side; motion was completely lost, and sensation impaired. From the previous history of the case and the present condition of the patient, Dr. Grimshaw gave the diagnosis of embolism of some vessels on the right side of the brain. The pulse was so weak, and the heart sounds so indistinct, that it was impossible to ascertain anything concerning the present state of that organ. The man quickly got worse, and died on January 1st.

The *post-mortem* examination displayed the conditions shown by Dr. Grimshaw to the Society, viz., general paleness of the brain, but especially of the right hemisphere, which was white and soft; an embolus occupying the termination of the right internal carotid and commencement of the middle cerebral artery, which no doubt was the cause of the softening and paralysis. The left ventricle of the heart was much thickened and dilated; the aortic valves were thickened and incompetent. Immediately above the valves a zone of calcareous deposit encircled the whole vessel; one part of this deposit was broken down and loose. The aorta was much dilated, and its coats thickened and softened.—*January 14th,* 1871.

Ulceration of the Lingual Artery.—Dr. J. Hughes said that the patient from whom this morbid specimen was obtained was a girl, aged 14, the youngest of three sisters, all of whom were attacked with scarlet fever within the last month. The eldest died after four days' illness. The second was admitted into the Mater Misericordiæ Hospital under my care, and recovered, while the third, the subject of this communication, was also admitted into my ward for a swelling of the neck, three weeks after the fever subsided, and while the desquamative process was going on.

Besides the ordinary symptoms of scarlatina, the three sisters suffered from inflammation of the cellular tissue of the neck; the eldest (it was ascertained) died of it from suffocation.

The second was similarly affected in hospital, but resolution happily took place, and the third was labouring under the affection when admitted, as already stated.

The swelling of the neck came on early in her case, and increased rapidly until it attained a considerable size, involving the right side of the neck, including the parotid, submaxillary, and a great portion of the cervical region, very much impeding the movements of the neck, and of the lower jaw; but there was neither dyspnœa, dysphagia, nor aphonia.

The swelling was smooth, peculiarly hard, and very tender to the touch; but on admission there was no point of fluctuation, and there was no pressing amount of constitutional disturbance.

After diligent fomentation and poulticing for four days, I thought there was a soft point to be felt, and accordingly on the 23rd December I made an opening over the yielding spot fully an inch in depth, and passed a director into the wound, until I was fully satisfied the fascia was divided and sufficient room made for the escape of any matter which might be formed; but none flowed at the time. A poultice was again applied until next day, when I again introduced a director, and moved it in every direction without finding any resistance such as an undivided fascia might present; still no matter escaped. The patient, however, was greatly relieved, the swelling abated from this forward,

and general relief was felt. She was able to be out of bed on the 27th, four days after the incision was made, and the neck was painted with iodine. She ate meat, and lived amongst the convalescents until the 2nd of January, when the other side of the neck became swollen, and, very much to her annoyance, she was directed to keep her bed again. Still there was no urgent symptom present. Two days after (4th January) she suddenly vomited a large quantity of blood (over a quart).

Next day she coughed up a spoonful of purulent matter, and on the morning of the 8th instant she had another vomiting of blood, during which she expired. All the previous time she was quite cheerful, had no distressing symptoms whatever, sat up in bed, ate meat, drank wine, and complained only of being kept in bed.

Post-mortem examination thirteen hours after death. The stomach was found quite full or rather distended with dark fluid blood mixed with large clots. The mucous membrane was carefully examined, but no trace of ulceration was discovered. The upper part of the œsophagus with the pharynx, tongue, and roof of the mouth were next examined. A cavity was then found filled with coagulated blood, corresponding to a portion of the neck, which was enlarged on the right side. The cavity was about two inches long, and half an inch wide, extending from below the right extremity of the hyoid bone, just in front of the external carotid artery up to a level with the angle of the jaw, and the parotid gland, which was enlarged. In removing the parts, the cavity was cut through, so that only its lower part was removed. In passing the finger into this part, its walls felt rough and jagged; and protruding into it below was the posterior cornu of the hyoid bone, a rough sharp spike, owing to the destruction of its coverings by ulceration. The cavity was about half an inch in front of the external carotid artery, the superior hyoid branch of which was found crossing its lower border. The lingual artery crossed the lower third of the cavity, and was completely severed, so that we were enabled to pass a small probe through the orifice which opened into the abscess. The upper and inner portion of the abscess communicated with the mouth by an ulcerated opening behind and below the right tonsil about the size of a threepenny piece.

In this case I have no doubt that matter was formed, found an opening into the throat, and was so discharged long before the patient applied at the hospital for admission, and it was owing to this fact we failed in procuring its discharge externally, for we found the incision had reached the cavity of the abscess, on examining the parts after death. The absence of any urgent symptom due to pressure on the neighbouring parts also strengthens this opinion, and it is probable the patient herself was not conscious of the passage of matter into the stomach, which may have occurred during the acts of deglutition.

The unexpected appearance of the vomited blood was the first serious symptom which occurred, but unfortunately it was not possible to ascertain the source of the hemorrhage, as the mouth could not be opened wide enough to permit an inspection of the fauces, on account of the recent swelling which occurred on the left side.

The remarkable case described in Sir Thomas Watson's Lectures is almost precisely similar to the foregoing, where an abscess of the neck formed as the result of cynanche tonsillaris and the lingual artery was laid open by ulceration, causing death by hemorrhage.—*January* 14*th*, 1871.

Cancer of the Uterus.—DR. ATTHILL said the specimen he exhibited was one of unfortunately a very common disease, but one they had not often the opportunity of exhibiting, inasmuch as these patients seldom died in hospital. It was a specimen of that form of epithelial cancer known as the cauliflower growth of the os uteri. The patient from whom it was taken was a young woman, aged twenty-eight. She was five years married, and had given birth to one child, who at the period of her admission into hospital was four years old : in the interval which had elapsed since its birth she had had three miscarriages, the last occurring twelve months prior to her admission. Her health had been very good up to October, 1869, when she, for the first time, remarked a sanguineous discharge, which appeared in the interval between two regular menstruation periods. It only lasted three or four days, and then ceased, but subsequently reappeared at irregular intervals during the next four months, never lasting more than a few days ; and as her general health continued good, she paid no attention to it. In March last this discharge became more profuse, and she was admitted into the Adelaide Hospital on the 16th of April. She was in a very anæmic condition. She complained of weakness and of pain in the back, but of nothing else. The discharge, which was very profuse, was of a sanguineous, watery character, and not very fœtid, and she stated that her mother and two of her sisters had died of cancer of the womb. On making a vaginal examination a cancerous mass, about the size of a hen's egg, was found growing mainly from the posterior lobe of the os uteri ; the anterior lip was also engaged, but in a lesser degree. The vagina was not implicated in the disease, the uterus was movable, and on passing the finger upward the cervix uteri appeared to be perfectly healthy. Dr. Atthill therefore thought it to be one of those cases in which it would be justifiable to give the patient a chance of prolonging life by operation, and he determined to attempt the amputation of the entire of the cervix uteri above the diseased portion. This was done accordingly on the 5th May last with the écraseur. Much difficulty was experienced in getting the chain round the cervix, the

mass being large and filling up the vagina. However, after some little manipulation, he succeeded in encircling the cervix above the growth, but the moment he attempted to constrict the cervix by tightening the chain, the apparently healthy tissue yielded, and it became embedded in a mass of soft cancer. The chain of the écraseur became entangled and embedded in the mass, and he found it impossible to remove the entire of the cervix. He succeeded, however, in getting away a large portion of the mass, the stump was then freely cauterized with strong nitric acid. The patient experienced no pain subsequently, and she improved greatly after the operation ; the hemorrhage entirely ceased ; she put up flesh, and was discharged after a few weeks. Dr. Atthill was aware at the time that this improvement could only be temporary, and he was not, therefore, surprised when the poor woman again sought admission in December last. She was then in a hopeless condition, dying rapidly, and she expired in the beginning of the present month. The body of the uterus, which he now exhibited, was perfectly healthy. The cavity did not exhibit the slightest trace of disease, which was entirely confined to the lower portion of the cervix, from which the cancerous mass could be seen growing. The vagina was now engaged, which had not been the case when she was first admitted. This case presented four points of interest. In the first instance, as to the age of the patient. It showed at what a very early age this form of cancer may attack the uterus ; and bearing on the question of age, Dr. Atthill mentioned that he had at the present time under his care in the Adelaide Hospital, another woman suffering from a similar form of disease, who was but three-and-twenty. It also illustrated the possibility of hereditary taint. The mother and two sisters of this woman had died of malignant disease of the uterus. It also illustrated the insidious manner in which epithelial cancer came on. When she was admitted she was in a hopeless state, and yet believed herself to have been ill but for a few weeks, and complained of weakness only. Lastly, as to the operation. It showed how very unpromising it was. He thought, however, that this was a case in which the operation was justifiable, for the woman's life certainly had been prolonged by it.—*January* 21*st*, 1871.

Gangrenous Abscess of the Lung.—Dr. LYONS said the specimen he exhibited was taken from the body of an unfortunate lad, aged nineteen, whose death was remotely due to drink. The account he gave was, that he was challenged, one morning at his work, to know what quantity of whiskey he could drink, by some man who had from time to time employed him in the capacity of coal-porter ; and he stated that he drank, between eight and nine o'clock in the morning, eight tumblers of raw whiskey. From the evidence of the boy's mother, there could be no doubt that he drank fully a quart of raw whiskey in a very short space

of time.   On finishing the last tumbler, which she tried to snatch from his hand, having heard what was going on, and having run to the spot to prevent her son from committing this excess, he fell down insensible, and was removed to a neighbouring hospital in a condition of profound coma, which continued for twenty-four hours.   During this period very active measures were properly employed to restore animation; and amongst others, hot jars were applied to the soles of his feet.   After the lapse of twenty-four hours he returned to consciousness; and then the individual who supplied him with drink, probably fearing some unpleasant consequences, came to the hospital and removed him.   He was taken to his mother's house, and being in a very febrile condition, he was seen by Dr. Byrne, who recommended him to be taken to the Hardwicke Hospital.   He was in an anomalous condition—great heat of skin, foul tongue, and quick pulse.   He had on the soles of both feet very deep burns.   On the heel of the left foot a slough had formed, which eventually, when it came away, exposed the os calcis, and under the ball of the great toe, there was another very large slough.   The condition of the other foot was similar.   It was quite manifest these were due to the prolonged application of excessively hot jars.   He thought it worth noticing that this profound amount of injury, and excessive degree of stimulation, had something to say to restoring him to life, though it was eventually the cause of his death—that it kept him alive until the alcohol had been removed from his system, and the nervous power again restored.   He continued with little change for several days. He should mention that he had on the buttock a very large, deep, inflamed mass of integument, which he expected every day to slough out, but it did not do so.   Whether that was produced by the application of heat, or by the fall, he could not say.   The boy continued in this condition, suffering for some days, and then began to complain of his chest. He was observed to expectorate large quantities of thick grumous stuff, of an anomalous character; and he finally expectorated a quantity of foul-smelling matter.   It was then obvious that an extensive fœtid abscess had formed in the lung.   He died in a few days subsequently; and on *post-mortem* examination they found a considerable amount of destruction of the right lung due to gangrenous action.   If they looked for the source of this gangrenous action, he thought they would find the explanation in two causes.   The boy's habits of life were peculiar.   He earned five or six shillings a day, and spent a great part of it in drink. He stated that his diet was peculiar; that he eat meat very seldom, and vegetables rarely, and lived on bread, eggs, and whiskey—an aliment likely to bring on a condition of the blood rendering him liable to disease of a low form, and of some gangrenous order.   The immediate cause of this gangrenous action was probably the sores in the feet, from which septic matter was brought up to the lungs.   It was altogether a very

striking and remarkable case. It was an instance of the effects of whiskey taken to excess; and it was to be regretted that some public inquiry was not held about the case; for the administration of alcohol in such a quantity must be held as likely to produce death as any other form of poison. The way in which death ultimately took place was also a matter of interest, being due to the influence of septic matter absorbed into the system from sores on the feet, arising from the too long action of hot water jars.—*January 21st,* 1871.

Syphilitic Deposit in the Liver; Ulceration of the Larynx.—MR. MORGAN exhibited a specimen of syphilitic ulceration of the larynx and gummatous syphilitic deposit in the liver. The existence of these deposits in this organ was not anticipated during the life of the patient, but was revealed on *post-mortem* examination. On the surface of the liver there were a few spots of elevation; and, on cutting into the interior of the organ, a number of deposits of a yellowish colour, and rather firm consistence, were discovered. The same appearances met with in the liver were found in several of the glands, particularly the glands about the trachea and the larynx. The subject of the disease was a gentleman who so long as nineteen years ago contracted syphilis in China. He suffered from but few constitutional symptoms, escaping uncommonly well, as he said himself. He remained in India a great number of years, and was married six years ago. His wife had had two miscarriages. He had no syphilitic indication whatever, and believed himself perfectly free from the disease. Two years ago he was broken down by fever and ague, and was greatly debilitated, so much so that he was carried on board ship when leaving for this country. He afterwards suffered from very extraordinary phenomena, which, from the first, I attributed to a latent syphilitic taint modified by aguish symptoms, and the general debility consequent on long residence abroad. He suffered excruciating pain in the back, and became paralysed of one leg, and then of the other. He lost the power of retaining his feces and urine, and was in a very critical condition for some time. Under the influence of tonics, iodide of potassium, and local counter-irritation, he quite recovered ; and from being paralysed, and in such a wretched condition that bed sores were threatened, he became much restored, so that he was able to go over to England, where he was for a year before he died. Gradually laryngeal symptoms set in, and he got a node on the sternum, and another on the back of the head, and then a certain amount of irritation, which he attributed to bronchitis. Mr. Paget, and others who examined him, could find no evidence of any disease in any particular part of the body. The gentleman paid him (Mr. Morgan) the compliment of coming back to Dublin, and placing himself under his care. He examined him carefully by the laryngoscope, and saw the rima

glottidis healthy-looking, and could detect no ulceration. He had no aphonia, but at times his voice was a little husky. He suffered from an intense bronchitic attack and profuse expectoration, occasionally with a purulent mixture, and also from fits of spasm. There was no evidence of solidification of the lung, or of any affection of it whatever. The only thing peculiar was a remarkable modified stridor or blowing sound behind the sternum, the explanation of which was found on the *post-mortem* examination, but was doubtful during the patient's life. The external glands of the neck had become indurated, and for some time he hesitated to say whether this might not be malignant. The glands in the tracheal region constricted the tube above the bifurcation, where it was now seen the cartilages had become eroded, and much narrowing had taken place. He had no tenderness of the larynx; no external evidence of its being diseased; and what the patient was particularly distressed by, were the fits of spasm and copious expectoration. On Wednesday week Mr. Morgan was sent for in a great hurry, and found the patient in *articulo mortis*. He laryngotomized him with considerable temporary relief. He died exhausted the next day. On a careful examination being made, the false and true vocal chords were found to be free from disease, and it was not until they came to the examination of the thyroid cartilage that ulceration was found. The ulceration extended down to the bifurcation, where the rings were eroded, the cartilages exposed, and the very remarkable narrowing was found which the members of the Society now saw; and this explained the difficulty of breathing which he had at the same time as these spasmodic fits. On examining further, to discover the cause of the spasms, he found the recurrent laryngeal nerve involved in the glands that had become filled with the same sort of yellowish gummatous material as that found in the liver. These glands, which constricted the larynx, had the blackish appearance so frequently seen in them. There was another circumstance worth noticing—that not only was there ulceration extending from the thyroid cartilage downwards to the bifurcation of the trachea, but down into the bronchus—the mucous membrane being eroded, and the rings exposed. The heart was softish, but there was no atrophy. The appearance of the liver was very remarkable when the specimen was fresh. The deposits were not hard, and the appearances coincided with those in the glands.

There were over a dozen gummatous deposits discernible, varying from the size of a pea to that of a bean; some were imbedded deep in the substance, and some on the surface. The matter was of that peculiar yellowish substance so characteristic of the gummatous deposits seen in the later cases of syphilis.

The case was interesting, as showing the latency of the disease, which, it might be observed, was initiated by a large sore and suppurating buboes, the scars of which the patient bore.

The gentleman said he had been ten years without a sign of syphilitic taint, and it was not until he became broken down by the hot climate of India that the persistently latent disease developed itself.—*January* 21, 1871.

Dilated Mitral Orifice.—DR. FINNY said the specimen, which in Dr. Stokes' absence, he now presented to the Society, was one which possessed some points of great interest—firstly, as being a well-marked example of disease, and secondly, in the history of the case, presenting evidence, by physical signs, of valvular disease, which had not found that corroboration on *post-mortem* examination, that one would have expected. The history of the case was as follows :—

M. N., aged 39, a labourer, was in good health up to eight or nine months ago. In last April, after taking a long walk in search for work, he noticed that his eyelids, hands, and feet were swelled. A month afterwards the swelling disappeared; but great gastric disturbance set in, marked by a feeling of distension in the stomach, and an unpleasant sensation after eating, followed frequently by vomiting. This continued for some time, and three weeks before his death, in the second week of last December, he applied for advice at the Meath Hospital. A fortnight before he had suffered from diarrhœa, and it was for this particularly he sought relief. The diarrhœa was very persistent and resisted all the astringents used, the symptoms being checked for a few days and then recurring. At the time of his entering the hospital, he was very anæmic in appearance, and suffered from noises in the ears, and a tendency to syncope on quickly standing up. This increased during his stay in hospital, and on the day of his death (the 29th December)—he was almost bloodless. The anæmia directed attention to the heart, and on applying the stethoscope, a loud single systolic bruit was heard at the mouth of the aorta, and along its ascending portion. At the apex of the heart an equally distinct systolic bruit, confined to the mitral area, was heard. The idea in his (Dr. Finny's) mind was that the latter was owing most probably to diseased valves, while that in the aorta was anæmic. A few days before death, he found a reduplication of one of the sounds of the heart; he could not say it was the first or second sound which was doubled, but he thought it was the first, as it was heard best over the ventricle, and towards the apex. The heart was acting quietly all through, the pulse being about eighty till a few days before his death, when he became convulsed and comatose. The urine was free from albumen. Its specific gravity was 1016. A small quantity procured after death showed a trace of albumen. The kidneys presented well-marked appearances of amyloid degeneration. Their weight was eighteen ounces, and the iodine test showed that mahogany tinge so characteristic of this disease.

The point of interest in connexion with them, was that the urine was never noticed to present that amount of albumen so generally found in cases of amyloid degeneration of these organs. The stomach and intestines were carefully examined, to see whether there was any ulceration or solution of continuity which would account for the bloodless appearance of the patient; but no such thing was found. The lower part of the rectum and colon were thicker than natural, and on applying the iodine test, the tint characteristic of amyloid degeneration appeared. The mesenteric glands were enlarged, and the liver and spleen also, but neither of the latter organs were distinctly amyloid. The heart was enlarged, and on cutting into the left ventricle, its cavity was seen to be elongated and dilated without much hypertrophy. The measurement from the attachment of the aortic valves to the apex gave $3\frac{5}{8}$ inches, whereas it ought, according to Bizot, to be 2·2 inches.

The aortic valves were perfectly healthy; so also were the mitral, not even presenting any appearance of thickening at their edges; but the orifice was plainly enlarged, and in size was about the same as the right auriculo-ventricular opening ought to be in health—the measurement being five inches, whereas in its normal state, it ought to be about four. In the left ventricle was found a clot which was quite white and extended into the auricle and for a considerable distance into the pulmonary veins. It consisted of fibrine and a great number of colourless corpuscles.

He thought it probable that the reduplication of the sounds of the heart was due to the partial formation of this clot during life. This remarkable sign has been noticed in some cases where a clot passed out of the aorta, but he was not aware of its occurrence being noticed in other cases.

The chief point of interest was the murmur at the left mitral orifice. The question whether a blood murmur may be heard at the apex of the heart is not decided. Dr. Stokes has always been in the habit of teaching that a blood murmur might be heard at the apex; and on the other hand, you may have no murmur at the apex of the heart and yet have extreme organic disease. Hence arose questions of diagnosis of great difficulty. Either that all murmurs at the apex are to be considered evidence of organic disease (as Hope taught); or, that they may be due to pure functional derangement in some cases; to blood changes in others; and to organic alteration of the valves or orifice in others.

The probability (in the case before the Society), is, that the dilated condition of the left ventricle led to a dilatation of the auriculo-ventricular orifice, and thus, the valves being incompetent to close the orifice, regurgitation took place, and the systolic murmur was produced.

This physical sign is spoken of by Dr. Gairdner, as a constant concomitant of the dilated state of the ventricle and as characteristic a sign as any other of this condition. This extreme view is, however, not supported

by other observers. Dr. Stokes, in his work on the heart, distinctly states that, while occasionally a systolic murmur may be developed at the apex in a weak, dilated heart, it is, as a rule, absent. Dr. Blakiston shows that the dilatation of the auriculo-ventricular orifice is by no means a common consequence on a dilated ventricle, for in 28 cases of the latter condition, in only four was the mitral orifice dilated.—*January* 21*st*, 1871.

Disease of the Aortic and Mitral Valves.—Dr. Magrath exhibited a morbid specimen which was removed from the body of a soldier of his regiment (the 8th Hussars), who died on the previous Saturday. He was thirty-six years of age, and had been in the regiment for twenty years. He had served in the Crimea and in India. He was at one time a man of intemperate habits, but latterly was not so much addicted to drinking as in former years. He suffered from rheumatism in India, and had one attack of syphilis; apparently not constitutional, for no secondary symptoms followed. On the 15th of November last, while carrying despatches in this city, his horse slipped on the pavement and fell heavily on the man's right foot, crushing it severely. He was removed in a cab to hospital, and it was found that he had sustained a very serious injury. The lower end of the tibia was fractured, as was also the lower end of the fibula, and the foot dislocated, so that the lower end of the upper fragment of the tibia was resting on the dorsum of the foot. The limb was put up in the usual manner, and everything went on favourably for some days; but on the 4th of January, having passed a very restless night, he was attacked with high constitutional and febrile symptoms, and a dark erysipelatous patch appeared on the foot and leg. After some days the ankle-joint became tense, swollen, and apparently about to suppurate, and an abscess eventually formed in front of it, which was opened and exit given to a large quantity of very healthy matter. From this stage the erysipelatous blush disappeared from the leg, and matters seemed to go on very well; but there was one thing remarkable—the extreme feebleness of the pulse, and of the circulation. He presented some of the symptoms of pyæmia, or blood poisoning. On examination of the urine, it was found that albumen was plentiful, and œdema of both legs set in shortly afterwards. On the 19th of the present month he was attacked suddenly by most painful micturition, and at that time the pulse became so weak that it was almost imperceptible. The extremities became cold, and, in fact, the man was in a state of collapse. He had very much the appearance of a person in a state of collapse from cholera. During the whole of the 18th and 19th he remained in this state, and on the 20th he was still in the same condition. On the night of the 29th the painful feeling of micturition disappeared altogether, and he then complained of extreme pain in the abdomen.

He (Dr. Magrath) thought that perforation of some of the hollow viscera had occurred, and that the man was dying from that cause. He became delirious on the 21st, and finally died with a loud scream.

On making a *post-mortem* examination, the following appearances were found:—On opening the cavity of the thorax, a large quantity of fluid was found in both pleural cavities. The lungs were congested, but not to any great extent, and their appearance was otherwise healthy. On opening the peritoneal cavity a considerable quantity of fluid was found in it. The kidneys presented well marked examples of Bright's disease.

The orifice of the aorta was narrowed to the size of the tip of the little finger; and growing from its circumference were a number of warty-looking productions, which resembled in appearance the syphilitic warts so often seen on the penis.

At the left auricle-ventricular opening, the same state of things existed. There was also a calcareous deposit around the attached margin of the valves, and the members might observe also the appearance of an early stage of atheromatous disease in the aorta.—*January 28th,* 1871.

Pneumonia.—DR. HAYDEN begged to exhibit a specimen which was, in one or two particulars, of considerable pathological interest. A man was admitted to the Mater Misericordiæ Hospital on the 14th of this month, in a very low state, manifestly in a typhoid condition. He was a pensioner, aged forty-five, who had led a life of intemperance.

On examining this man when he first saw him, he discovered pneumonia on the left side; but what was singular was that the physical signs of this disease were accurately limited to a space of three inches in diameter, to the left side of the left nipple, a little outside the point of pulsation of the apex of the heart; here all the physical signs of pneumonia—in the second stage—dulness on percussion, bronchial respiration and voice were detected.

On the following day, crepitant râles were superadded, and from day to day it was observed that solidification was gradually extending upwards, until at last it involved the apex of the lung, when the man died in a state of coma not very dissimilar to that in renal disease, yet without any evidence whatever that the kidneys were affected, the urine being normal as to specific gravity, and reaction to heat and nitric acid.

The case was an example of pneumonia limited to the upper lobe of the left lung, the inferior lobe being perfectly free; while the entire of the superior lobe was solid; but there was evidence that the disease commenced in the tongue-shaped process of the superior lobe of the left lung, which overlay the pericardium. This portion was in the third stage of pneumonia, as evidenced by its infiltration with sero-purulent fluid, whereas the remaining portion of the lobe was in a condition intermediate between the second and third stage. It was in a state of

hepatization, but one section yielded some thin serum. In adynamic or typhoid pneumonia the inflammatory process, according to his experience, usually commences in the apex of the lung, subsequently extending downwards till the entire of the superior lobe is involved. In the case just narrated, however, this order was inverted.—*January* 28*th*, 1871.

Hypertrophy with Dilatation of the Right Ventricle.—DR. HAYDEN submitted to the Society an example of disease of the thoracic viscera, which, as regarded diagnosis, he thought was of considerable interest. A van driver, thirty-eight years of age, was admitted into the Mater Misericordiæ Hospital on the 17th of January. He was then suffering from extreme dyspnœa. His face was livid and bloated, and the cervical veins turgid to the last degree. The lower extremities were œdematous and livid. The pulse was very slow, full, and regular. There were all the physical signs of emphysema of the lungs, with bronchitis in an aggravated form. The history of the case was as follows:—From childhood, as reported by his wife, he had been short-breathed. He had lived somewhat intemperately. Up to three weeks before the date of his admittance he was in his usual health. About that time his feet began to swell, and he was no longer capable of discharging his ordinary duties. When admitted the man was in the condition previously described; and in addition to the pulmonary affection, physical examination of the chest showed that the heart pulsated behind the lower end of the sternum. The sounds were of that sharp clicking character, especially the first, which indicated ventricular dilatation, and a double murmur was heard at the base of the ensiform cartilage. The first of these murmurs was rather harsh, and accompanied the first sound without obscuring it. The second murmur was not exactly synchronous with the second sound; it was also harsh in character, but much less loud. Both murmurs were circumscribed, not extending beyond an area of two inches from the point indicated, and equally in all directions.

The precise state of the heart, as indicated by these physical signs became a question of much diagnostic interest. It was manifest, the diagnosis lay between disease of the aortic valves, involving obstruction and reflux, tricuspid and aortic reflux, and pericarditis, giving rise to a double friction sound. He had no hesitation, after careful examination of the case, in determining that the latter was the cause of the sounds heard—namely, pericarditis; firstly, from the slight deviation from the normal rythm of the second sound of the heart exhibited by the latter of these murmurs. Thus, although the first murmur was synchronous with the first sound of the heart, the second deviated from the second sound, and with charcteristic unsteadiness, being sometimes anterior and sometimes posterior to the latter in time; secondly, from the harsh character of both these sounds; and thirdly, because of their manifest proximity to the ear

of the observer.   As regards a double aortic murmur, he considered that excluded by the fact that the second sound was harsh.   He quite agreed with Hope in the opinion that a diastolic murmur at the aortic orifice is scarcely ever of a rough and grating character such as was heard here; and this, notwithstanding the very decided opinion of Dr. Walsh to the contrary.   Then, as regards tricuspid regurgitation, he felt confident this could not have been the cause of the principal of the two murmurs, for in cases of distention of both of the right chambers of the heart, he had never heard a reflux tricuspid murmur, notwithstanding that tricuspid regurgitation was actually present, as shown by systolic venous pulse in the neck.   He thought it might be accounted for thus:—Where the right chambers of the heart are engorged to distention, the right ventricle is in a state of *asystole* or partial paralysis—at least its muscular con- tractile power is so impaired as to be incapable of developing a force sufficient to give rise to a murmur.

Repeatedly he had heard tricuspid murmur where distention of the right chambers did not exist.   He thought it might be held that tricuspid regurgitant murmur indicated, not a state of enlargement of the right auriculo-ventricular opening, but a positive valvular lesion where the muscular power of the right ventricle was not seriously impaired.   The man died on the 23rd of January.

It would be observed that the heart was of that globular shape which it generally presented when the right ventricle was much hypertrophied. It weighed twenty ounces and a half.   Three fingers could be passed through the right auriculo-ventricular opening.   The left auricle and left ventricle were not much altered.   The latter was thickened but not dilated.   The apex was formed exclusively by the right ventricle, which was greatly hypertrophied and dilated.

The chambers of the heart contained decolourized fibrin.   The valves were all perfectly sound in structure.   He should have observed that evidence was found of chronic pericarditis.   Upon the anterior surface of the right ventricle there was a "milk spot" of more than usual magnitude, and upon the right apex of the heart a layer of false membrane partially adherent.   The apex of the heart was displaced downwards and inwards, and lay behind the base of the xiphoid cartilage, and it was precisely here that the two murmurs were heard.   It was quite evident that the cause of both murmurs was the friction produced by the movements of the apex of the heart upon the corresponding portion of the pericardium.—*January 28th*, 1871.

Internal Strangulation:—Anatomy of the Vermiform Appendix.—DR. T. E. LITTLE, in presenting this specimen, said:—Although the physiolo- gical meaning of the vermiform appendix is so little understood, its pathological importance has been long and definitely recognized.

Abnormal conditions of it are known to enter into the explanation of various forms of obscure abdominal affections. Of these the chief are—— 1, abscess in the right iliac fossa; 2, internal obstruction of the intestines. It is to a case in which the latter of these accidents, caused by this small organ, has occurred, that I now wish to draw attention.

There are three described methods in which the appendix cœci can produce intestinal obstruction, viz.—1, it may become so twisted round a loop of intestine as to cause obstruction by a mechanism similar to that peculiar twisting of the gut upon itself, known as volvulus (a condition alluded to by Trousseau, and a case illustrative of which is given by Mr. Handcock[a]); 2, it may at its free extremity contract adhesion to some neighbouring part, and through the aperture so formed, an internal intestinal hernia may occur (cases of which are recorded by Abercrombie,[b] Dr. Risdon Bennett,[c] Dr. Hilton Fagge,[d] and others); 3, a similar internal hernia may take place by the slipping of a loop of intestine through a hole—either congenital or acquired—in its small mesentery (as in a case given by Mr. Partridge.[e])

The specimen on the table consists of the terminal portion of the small, and the commencement of the large intestine, with their peritoneal attachments. It was removed from the body of a man, aged sixty, of powerful frame of body, who had enjoyed excellent health, and was engaged in active work, as a wine merchant's porter, up to the moment of the fatal attack, nine days after the first evidence of which he died, with symptoms which may, in brief, be described as those of unrelieved strangulated hernia.

On opening the body, all the organs examined were found to be perfectly healthy, except those concerned in the lesion under observation.

There was no general peritonitis, and even in the region of the strangulated gut but a very small amount of lymph was to be seen between the intestinal folds.

From a point near the tip of the vermiform appendix a narrow, but strong whitish band is seen passing to an attachment into the front of the ilium, at a distance of about two inches from the termination of the latter gut, and through the opening left between this cord, the appendix itself, and its attachments, a large loop (16 or 18 inches in length), of that part of the ilium, immediately above the attachment of the band alluded to, has become prolapsed, and is tightly constricted, so tightly that in the recent specimen, a narrow probe was with some difficulty passed between the constriction and the intestine. The piece of gut strangu-

[a] Lond. Journ. of Med., 1851, p. 247.

[b] Dis. of Stomach, p. 121.

[c] Trans. Path. Soc., Lond., Vol. iv., p. 146.

[d] Guy's Hosp. Rep., Vol. xiv., p. 349.

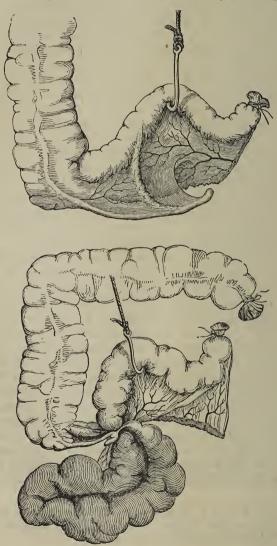[e] Trans. Path. Soc., Lond., Vol. xii., p 110.

lated is of deep brown colour, is much distended, and is in a condition of incipient gangrene, the peritoneum stripping off it in most places under the mere touch of the finger. All the small intestine above the constriction was considerably, but not greatly, distended; the large intestine also was fairly distended; the only portion of the intestinal canal which was flaccid and devoid of gas being that small terminal piece of the ilium between the stricture and the ileo-cœcal valve.

In endeavouring to interpret these *post-mortem* phenomena, at a first glance it might seem as if the case belonged to the second class of those above referred to—that is, that the obstruction resulted from an abnormal band of adhesion, connecting the vermiform appendix and the ileum; but on looking more closely to the particulars of the case, and the appearances met with, there seem to be many things against this solution of the matter; no pathological trace of peritonitis existed in the abdominal cavity; nor was there any other appearance of adhesion discoverable in the neighbouring or any of the other regions of the abdomen; the vermiform appendix itself, and the part of the ileum to which the band is attached, are both perfectly healthy;[a] no account of any antecedent attack of peritonitis, or of the occurrence of any important abdominal affection, appears in the history of the patient's previous health; the peritoneum is carried over the constricting band uninterruptedly, just as over the neighbouring organs; and, again, the fact that this band is attached to the side and not to the tip of the vermiform appendix is consistent with the interpretation to be given.

In reference to the question suggested by this case, I have been led to examine more attentively, and in numerous instances, the normal arrangement of the pieces of peritoneum connecting the vermiform appendix to other parts, an accurate knowledge of which seems to me to afford a clue to the most likely explanation of the condition of things in the present case. I have here three specimens of the ileo-cœcal region of the intestinal canal, selected at random from three bodies at present under dissection in the adjoining anatomy room; and they all exhibit an arrangement of the peritoneal connexions of the appendix, which will be found to be a constant one, with, of course, variations within limits, and to which our ordinary anatomical text books make no allusion. The appendix can be seen to be connected by a double fold of serous membrane (its mesentery) to the under surface of the mesentery of the ileum, of which this fold is a process, and not directly to any part of the abdominal walls; but in addition to this proper mesentery, in all cases, where disease has not distorted the parts, there will be found a second

---

[a] In all the cases of bands of adhesion which I have found recorded, these bands have occurred either as a part of general peritonitis, or else the vermiform appendix, or the organ to which it adhered, had been diseased.

duplicature of the peritoneum passing from the upper edge of the
appendix to the inferior and anterior surface of the ileum at its
termination, having a free concave margin looking towards the left side,
and extending on the latter organ for a distance of about two inches
from its termination—that is, exactly to the point where the little cord
alluded to in the specimen I have exhibited has its insertion. This
peritoneal fold is quite distinct from the mesentery of the appendix, a

well-marked peritoneal *cul-de-sac* lying between them; and it generally contains between its serous layers a small mass of molecular fat, and one or two small vessels, giving it a general structural resemblance to the great omentum; it might, in fact, be termed the *ileo-cœcal omentum.* Figure 2 depicts the appearance as met with in one of the specimens shown.[a]

In the absence, then, of any evidences of causes likely to produce pathological adhesions, and bearing in mind the above anatomical details, it seems to be a justifiable assumption to make, that the present case belongs rather to the third class of those alluded to—viz., those in which a hernia of the intestine has occurred; not indeed through the proper mesentery of the appendix, but through an aperture in the little shelf of peritoneum just described; and that, therefore, the constricting band in this case is not a pathological product, but a normal anatomical structure.—*February 4th,* 1871.

Phlebitis.—Dr. Lyons said the parts which he now exhibited were taken from the body of a man aged sixty-three, who was admitted to the Whitworth Hospital in a very low and weak condition. He was extremely pale, blanched, and apparently anæmic, with a very weak pulse, and in a condition of great general debility. His principal complaint, however, was referred to the left leg, in which he suffered very considerable pain down the line of the great vessels. The limb was very much distended, and œdematous down to the ankle. The œdema was very dense; it hardly pitted on pressure, and any slight depression caused by the finger rapidly disappeared. In the line of the great vessels, there was tenderness on pressure, up to Poupart's ligament. There was so much distension of the whole limb, and so much distress and suffering, that for the first two or three days no very minute examination could be made of the vessels. Rest in the recumbent position, soothing treatment, and the application of poultices reduced the swelling, and they were then able to trace a very large, hard cord-like mass running from the groin along the course of the great vessels.

The swelling could also be traced upwards above Poupart's ligament to some extent. There it became diffused, and owing to the thickened condition of the integument it was not, for many days, possible to make out whether the plugging of the vessel was due to a tumour of considerable magnitude pressing on the internal iliac vein. As the swelling diminished he could trace the vessel more distinctly above the line of Poupart's ligament.

The clot could be felt quite hard, and where the vessel joined the

---

[a] This anatomical arrangement is mentioned in the works of Huschke ("Splanchnologie"), and of Aeby ("Der Ban des Menschlichen Körpers").

saphena vein it was lost. The saphena vein could be traced a long way down, and several knotty prominences were observed in it. Some five days before the man's death a very large vesicle formed suddenly and spontaneously in the lower part of the left leg. It contained from seven to eight ounces of very clear serous fluid, which was not albuminous when tested with heat and nitric acid. He now expressed himself somewhat relieved, and thought he was going to recover. Suddenly, however, one morning, when Dr. Lyons visited him he found him sitting up in bed in a peculiar position—an attempted diagonal decubitus, and apparently much distressed. The dyspnœa was extremely urgent. On examining the chest a considerable amount of serous effusion was found in the thorax; and it was ascertained by percussion that the whole of the left side was completely dull.

It was now pretty evident that an effusion of considerable extent had suddenly taken place into the left pleural cavity, so completely over-powering the lungs and heart that the man rapidly sank and died. On *post-mortem* examination a clot was found of considerable dimensions running above the valve usually found at the termination of the external iliac and the commencement of the femoral vein. It commenced there, and was lost at a point not very well defined, where the internal iliac vein unites with the vena cava. The latter vessel was itself free from disease, without clot, and its lining membrane gave no evidence of inflammatory action. There was not any inflammatory condition of the lining membrane of the femoral vein. On examining the condition of things in the cavity of the thorax, there was found an excellent example of very acute pleuritis; the membrane presented a very fine deposit of lymphy matter in granular particles, giving a roughened surface like a cat's tongue. There was an enormous effusion into the left side of the chest, compressing the left lung very considerably. The whole of the pleural surface was covered over with a fine layer of lymph. There was a considerable amount of deep congestion through the substance of the organ, in the upper lobe especially. He had endeavoured to find whether there was any embolus in the pulmonic veins or arteries, but there was no trace of anything of the kind. The right lung exhibited considerable evidence of old disease. There was a form of deposition which he was inclined, from the situation it occupied and the nature of it, and the character of the surrounding lung tissue, to think was not a tubercular deposit, but a formation of lymphy matter in the lung subsequent to the pneumonic engorgement of the organ. The heart was rather small, and had some superficial fatty matter, but no considerable amount of clot internally, and the valves were perfectly free from disease. This was no ordinary case of an embolus detached from fibrin, going the round of the circulation until stopped by a vessel too small to allow it to pass through. Were they to consider it an example of phlebitis giving

rise to a deposition in the femoral vein? He did not recognize in the condition of the vein any evidence of phlebitis. Looking to the condition of the serous surfaces in the cavity of the thorax it might be supposed, by a parity of reasoning, that a similar process had been present in the vein that was manifestly present in the serous surface of the pleura. He did not think that necessarily followed. He was more disposed to look on this as a result of the condition of the blood of the patient. His condition was peculiar, the pallor was extreme, and he had a worn look like that supposed to be associated with malignant disease, and it passed through his (Dr. Lyons') mind whether there might not be a mass of glands affected with cancerous deposit. He was disposed, however, to regard this as an instance in which the starting-point of the disease was the blood; first a condition of degeneration, and then a spontaneous collection of fibrin took place in the vein and so plugged the vessel, and he thought this explained also the rapid and sudden termination of the case. The morbid condition of the blood induced inflammation of the pleura; that led to sudden effusion, which was the cause of death.—*February 4th*, 1871.

Embolus obstructing the Right Pulmonary Artery.—Dr. HAWTREY BENSON exhibited a specimen which had been removed from the body of a patient who died under his care, in the City of Dublin Hospital. He was admitted for rheumatic fever, and five days passed over without the occurrence of any complication whatever. On the evening of the fifth day, the resident student, when going his rounds, examined this patient, talked to him, took a note of his respiration, pulse, &c., and left him going on well. In a few minutes afterwards a message came to say that a man was dying. He went up stairs to the ward, and found it was this man whom he had just left apparently doing well. He was now suffering from the most extreme paroxysm of dyspnœa. Remedies were at once applied, but before they could take effect the man died. It became a matter of interest to know what he died of. When the chest was opened, the heart was found, as had been diagnosed during life, perfectly sound both on the left and right sides. The valves were quite free from disease. The brain was also perfectly sound. The lungs were much congested in every part, particularly the lower lobe of the right side. At the suggestion of Dr. Purser, he dissected up the pulmonary arteries to see if anything could be found to account for death, and he did very soon come on what he might fairly presume to be the cause of death. In the right pulmonary artery, just where it divided to supply the various lobes, he found a large embolus. It lay saddle-like across the projecting fork which separated two large branches going to different parts of the lower lobe. Thus portions of the clot ran into each of the arteries without being tightly impacted into either. Around the embolus a certain

amount of thrombosis had occurred, so as more completely to occlude the artery as it was found after death. The embolus was precisely similar to some clots found entangled among the trabeculæ of the right auricle of the heart; and, doubtless, it was from this chamber that the clot, having been detached, perhaps during temporary excitement of the heart's action, was carried on with the current of the blood till it was arrested where it was found.

It became evident then that the case was one of hemorrhagic infarction described by Virchow and Ludwig, as being caused by embolism of a branch of the pulmonary artery, and the cause of death was this sudden infarction, along with the collateral hyperæmia of the rest of the lung, occurring in a patient whose blood was predisposed, from its hyperinetic state, to stasis.

In support of this view he might mention the result of the microscopic examination of the lung. There was some blood seen to be present in all the alveoli, and in many the quantity of blood was small, while their walls had a shrunken and collapsed appearance, and in no part were the alveoli fully distended with blood, as in pulmonary apoplexy depending on certain other causes. But the most prominent feature in all the sections was the enormous engorgement of the capillaries and the smaller vessels.

The presence of blood in the alveoli was evidently due to the mechanical escape of that fluid from the distended capillaries, and that condition of the capillaries was due in its turn to the unnatural influx of blood into the part from which the *vis a tergo* was removed, which was derived from the collateral circulation, according to Virchow's explanation.

This individual case, however, would seem to lend more support to Ludwig's theory of the cause of hemorrhagic infarction due to embolism; for the two branches of the pulmonary artery supplying the lower lobe were not entirely occluded at first by the embolus. It rather hung into each vessel, filling up the greater portion of their calibre, but not the entire. The result was that the current of blood in those arteries was not stopped, but merely rendered slower. As a consequence of this the corpuscles in the capillaries coalesced, and stasis ensued, so that a plug was rapidly formed in each of the capillaries. At the same time blood was being slowly propelled past the embolus into the part of the lung beyond it, so that presently the pressure on the inside of the capillaries became equal to that on the inside of the occluded arteries; and as the resisting power of the capillaries was unequal to the emergency, blood escaped into the alveoli.

Whichever view we accept, Virchow's or Ludwig's, the case is illustrative of one of the many dangers which beset the course of acute rheumatism, and warns us how guarded we must be in our prognosis even in cases apparently the most favourable.—*February 4th*, 1871.

Cirrhosis of the Kidney.—Dr. Finny said the specimens he wished to exhibit were taken from the body of a patient, aged twenty, admitted last month to the Meath Hospital, under the care of Dr. Stokes. The symptoms complained of were incessant vomiting, with pain and distress in the stomach. The patient's previous history had been that in his capacity of a machine-feeder in a newspaper office, he was exposed to chills in passing from hot to cold rooms, but he was not addicted to intemperance, and had always lived a quiet life. From his boyhood he complained of asthmatic symptoms, but otherwise he enjoyed good health until seven months ago, when he noticed his feet becoming swelled and his eyelids puffed. Vomiting set in, and great distress was experienced on taking food. He sought relief in a Dublin Hospital, and derived benefit while there, but during that period his feet became still more swelled, and he passed water in large quantities—so large that it suggested at first thought, when taken in connexion with his great thirst, the possibility of his having diabetes mellitus, but the physicians (he states) at the hospital decided that there was no sugar in the urine. Three weeks after, he fell back from the condition he was in when in the hospital, and the urine became extremely great in quantity, so that the frequency of his calls at night was his chief complaint. He never was in the habit of eating sweets, so that the history of the case did not afford any grounds for explaining the symptoms. He has had great thirst for over a year, and his chief drink was milk, of which he partook largely. If he stinted his drink he noticed the quantity of urine became diminished; but he suffered from dryness of the mouth, throat, and fauces. The vomiting, while in hospital did not always follow upon the introduction of food into the stomach, because it came on quite as often in the morning, before food had been taken, as afterwards. He presented a puffed appearance under his eyes, and was slightly anæmic. His breathing was evidently altered; the expirations were prolonged, and he had the physical signs of chronic bronchitis, with emphysema of the lungs. The abdomen was painful on pressure, but there was nothing discoverable beyond a slight enlargement of the liver below the ensiform cartilage. The recti muscles were rigid. On pressure over the loins a dull pain was experienced. He went on for some time with very little alteration of the vomiting. He was requested to limit his drink as much as possible, so that the urine fell in quantity. On the 9th he became suddenly unconscious, and had convulsions of an epileptiform character. He recovered consciousness shortly, but appeared to be sinking. On the next day he presented signs of collapse; his pulse was 140, and he had orthopnœa; there was great abdominal tenderness, so that it was thought he had got peritonitis, but the day following the abdomen became free from pain, except over the region of the spleen; the pulse fell to 68, and finally to 50, but the respiration became laboured, being

44 in a minute. The quantity of water, which had been so copious previously, diminished, in a most marked degree, the day after the convulsion. On the 7th he passed, in the 24 hours, $6\frac{1}{4}$ imperial pints, or 125 ounces of clear urine, almost whitish-looking. Its reaction on that day was neutral, and on the next day the specimen he examined was slightly alkaline. In two days afterwards the urine fell to 80 ounces; on the 11th (the day following the convulsions) to 20 ounces; on the 12th to 4 ounces, which were drawn off by the catheter, and on the day of death he passed none, while in the bladder a very small quantity was found. The specific gravity of the urine, from 10·10 to 10·12, negatived the idea of diabetes, and not a trace of sugar could be found with Trommer's test. On heating it, it grew cloudy, and threw down a deposit of albumen, amounting to one-third of its bulk. At no time did it become ammoniacal, even after keeping it several days, no doubt owing to the small quantity of urea contained in it. The most careful examination by the microscope failed to discover any renal deposition, either casts or cells. This was owing to the small quantity of detritus, as is usually the case in contracted kidneys, and possibly we did not select enough for examination.

The *post-mortem* examination showed simple hypertrophy of the left ventricle of the heart, which was otherwise healthy. The lungs presented a considerable amount of emphysema. The stomach was large, and its mucous surface covered over with a large quantity of thick, viscid, opaque mucus, but no disease was found in it or in any other of the organs sufficient to make them worth showing to the Society. The ureters were perfectly healthy, and not dilated. The kidneys were smaller than natural, especially the left, which presented the appearance of a pear with a tendency to lobulation, such as might have been expected from the history of the case. The microscopic examination, as far as he could make out, showed that the cortical substance was diminished to such an extent that the straight tubes ended at the capsule in some places; in others not so, the disease not being there so far advanced. Whatever remained of the cortical portion presented evidence of advanced disease; the Malpighian corpuscles were thickened, and the tubes leading from them were disorganized in many cases; in others they were full of granular epithelium. The straight tubes of the medullary portion were healthy. It was plainly a case of contracted or cirrhosed kidney. One point of interest was the age of the patient. Generally this disease occurred in people of advanced age. The chief point, however, was the diuresis and the combination of so large a quantity of albumen. Diuresis was a constant sign of this small contracted kidney, but it rarely exceeded three or four pints. There were only a few cases on record in which the diuresis was so excessive as it was in this case. Christison, Prengler, and Roberts mentioned cases in which it reached to five pints; and in one case to nine pints. The

highest record in this case was six and a-half pints, but the patient thought, before he restricted his drink, it was more. In the cases mentioned by Christison and Prengler, the diuresis followed either convulsions or the disappearance of the dropsy. In this case it was otherwise, as neither of those symptoms occurred before the appearance of the urinary symptoms. The ordinary symptom of the small contracted kidney was the small but persistent quantity of albumen; but the quantity of albumen in the urine, such as existed here, was generally supposed to be associated with fatty kidney, and was very unusual in the cirrhosed. It is not possible to do more than guess at the cause of the unusually large quantity of urine in the case before us, and the still more unusual concomitant in such quantities—albumen. But some reasons may be adduced for those symptoms in ordinary cases. The explanation of diuresis in the cirrhosed kidney, where the cortex is the portion of the organ chiefly degenerated, is extremely difficult, if not impossible, if the present physiological teaching of the urinary excretion be received— namely, that the water is transuded through the walls of the Malpighian capillaries, and the solids are secreted by the epithelium of the tubes of the cortex.

Dr. Finny differs, however, from this view, as he has more fully explained in a paper on "Polyuria in Some Forms of Chronic Renal Disease" (*Dublin Quarterly Journal*, May, 1870), and, considering the secretions of the water, *alike* with the salts, to be the function of the epithelium, he looks upon the Malpighian capillaries as regulators of the blood-stream in both the cortex and medulla. In cirrhosis many of the Malpighian bodies become degenerated, the walls of the capillaries thickened, and their calibre diminished, while the tubules, in the ends of which they lie, are degenerated, narrowed, and impervious. The blood, owing to this cause, unable to pass with its ordinary freedom, exerts an unwonted pressure on the walls of any remaining healthy Malpighian capillaries in the cortex, through which, under these circumstances, the serum transudes, and will thus account for the albumen in the urine; and the more rapid the progress of the disease, the greater will be this albuminuria. But, owing to the same cause and also to the loss of the regulating power of the Malpighian capillaries, the blood is forced in fuller stream and stronger current into the capillaries among the straight and looped tubes of the medulla—the vasa recta—which by Ludvig, Virchow, and Beale, have been demonstrated to arise direct from the renal artery. As a consequence of this, a more copious secretion of a watery urine is effected—a process, though differently obtained, similar to the diuresis of low specific gravity in hysteria, where, owing to deranged innervation, we suppose the capillaries are no longer under the control of the vaso-motor nerves, and are accordingly dilated.—*February* 4th, 1871.

Embolus Obstructing the Right Middle Cerebral Artery.—Mr. HAWTREY
BENSON said the specimen he now exhibited had been removed from the
body of a patient who died some days before in the City of Dublin
Hospital.   The patient was a woman, aged fifty-six, who was admitted
for rheumatic fever, the course of which showed rather a mild form.
At the time of admission she presented evidences of aortic and mitral
valve disease.   Everything progressed well for seven or eight days ; but
on going his rounds one morning, he observed her face turned to the
right side, while the left was blank and expressionless.   On making an
examination, he found the whole of the left side of the body completely
hemiplegic, with total loss of motion and sensation.   There was no
rigidity of the muscles, nor any twitching either at this or at any
subsequent time.   Her mental faculties were but slightly altered.   She
spoke intelligently when addressed, but answered very slowly, and with
evident difficulty ; yet it was only seldom that she showed any decided
confusion of ideas.   This slight mental perturbation existed during the
whole progress of the case.   The loss of motion continued complete until
the end, but the insensibility of the parts so rapidly diminished that in
two or three days she felt almost as well on the one side as on the other.
Soon, however, a severe attack of bronchitis set in, the patient gradually
lost strength, and on the seventeenth day from the date of the occurrence
of the hemiplegia she died.

On making a *post-mortem* examination he found—as he had expressed
a belief during the life of the patient that he should find—an embolus of
one of the cerebral arteries.   The middle cerebral of the right side was
the artery occupied by the embolus.   Behind this embolus the artery was
the seat of a thrombosis extending as far backward as the orifices of the
perforating arteries.   He found the hemisphere perfectly sound, but on
reaching the right lateral ventricle he found the corpus striatum remark-
ably diseased.   It looked extremely prominent, and of a brownish-red
colour, and was very soft; so much so as to give an appearance as
if there was an extravasation of blood into it.   On making an oblique
section of this body, it was found that there was no extravasation
of blood.   There was no hemorrhagic centre, nor any punctiform
appearances as if a number of small vessels had given way.   On the
contrary, the dark colour and the softened consistence were perfectly
uniform, and extended through the corpus striatum in a remarkable
manner.   The only parts of the corpus striatum appreciably diseased
were the intra and extra-ventricular nuclei, and the white parts were
apparently natural and healthy—white and firm.   The entire of the grey
portion was extremely softened, and the same dark red colour pervaded
the whole structure symmetrically and uniformly.   The case, then, was
evidently one of red softening due to the embolism and subsequent
thrombosis of the perforating arteries.   A few days ago, Dr. Grimshaw

showed at the Society a case of cerebral softening resulting from embolism; but in that case it was *white* softening, whereas in the present it was *red* softening. The differences that resulted in these two cases, from the same apparent cause, were evidently due to the size and importance of the respective arteries occluded. In Dr. Grimshaw's case it was the internal carotid artery and some of the arteries of the circle of Willis that were affected; and so large a portion of the blood-supply was thus cut off from the brain that there was not sufficient collateral circulation to cause capillary reflux of blood, when the *vis a tergo* was suppressed in the artery; and the anæmia, which was the immediate consequence of the embolism, remained permanent, and, as a matter of course, softening ensued. In this case, however, it was different; for the arteries occluded were small, and the neighbouring arteries were numerous, and free to pour in their blood into the parts from which the *vis a tergo* was removed, so that after a primary transient state of anæmia, a secondary permanent state of hyperæmia and stasis ensued, causing both the red colour, and subsequently, the softening.

This case was interesting, not only on account of the remarkable limitation of the softening to the grey portions, but still more so in connexion with another case which he showed at the previous meeting, of embolus of a branch of the pulmonary artery. The two cases were admitted within a few hours of each other into the hospital, and subsequently died within 36 hours of each other. The patients suffered from the same disease, acute rheumatism; both ran a mild course for a certain period, and the course of the disease in both cases was suddenly checked, and the death of the patients finally caused by an outward and completely uncontrollable accident of disease (as he might call it), precisely the same in its anatomical nature, though different in the organ it affected in each case. It was interesting, also, as affording another instance of the many dangers which beset the course of acute rheumatism.— *February* 11th, 1871.

Varicose Aneurism.—DR. STOKES exhibited a remarkable example of this disease, in which an aneurism of the aorta, originating in one of the sinuses of Valsalva opened into the right ventricle, immediately below the valves of the pulmonary artery. The following was the history of the case:—

A man, aged thirty-one, of intemperate habits, was admitted into the Meath Hospital on the morning of the 18th of January, 1871. Six years previously he had been treated by Dr. Hudson for an affection of the heart, after which he continued to enjoy good health until a month before the period of his second admission, when, from hard drinking and exposure to severe cold, his health and strength gave way; his breathing became oppressed, and his feet swelled. He now applied at a dispensary;

mercury was prescribed, and he was profusely salivated. This treatment was not followed by any improvement, and he therefore obtained admission into the Meath Hospital.

He was now anasarcous, and suffered from severe dyspnœa, and great oppression in the region of the heart. The liver could be felt extending below the ribs, nearly down to the crest of the ilium. The area of cardiac dulness was much greater than natural, and the impulse of the heart was diffused to a corresponding degree.

Auscultation detected three distinct murmurs, two at the base of the organ—a loud, harsh murmur of exodus, and a faint, badly marked regurgitant murmur.

Tracing down towards the apex, this murmur became more indistinct, until the apex was reached, where it was very distinct, of a blowing character, and systolic in time. There was no visible pulsation of the arteries, nor was the collapsing pulse well-marked.

On applying the hand over the base of the heart, a fremissement could be felt with remarkable distinctness, following the cardiac impulse. At the seat of this fremissement the patient was sensible of a peculiar sound, which he compared to that of " a woman churning." After a few days the aortic regurgitant murmur was much better marked, and in proportion as it became so, the feeling of collapse in the pulse became less and less distinct, until finally it disappeared.
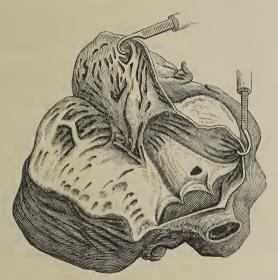

Dr. Hayden visited the patient along with Dr. Stokes on the 3rd of February, and again after a few days. Upon the latter occasion, the fremissement had entirely disappeared, and the basic bruit of exodus, from having been rough and rasping, had become of a blowing character.

There were now two distinct murmurs at the apex, one systolic and having a rough metallic ring, and the other diastolic in time and of a softer character, and Dr. Hayden suggested that it might be caused by regurgitation in the walls of the ventricle, and that the case was probably one of aneurism of the ventricle.

The results of the *post-mortem* examination were the following :—The heart was much enlarged ; the right cavities were distended with blood, and the left ventricle was much hypertrophied. The mitral orifice and the two curtains of the mitral valve were normal.

This is a remarkable fact, and would seem to indicate that where a well-marked basic murmur exists along with a murmur at the apex, the existence of the latter does not necessarily establish the fact that the mitral valve is diseased. It is not by any means improbable that, in many of these cases, the murmur heard at the apex of the heart is merely the basic murmur conducted by the body of the ventricle itself.

The aorta was greatly dilated, and its tunics much diseased. From the anterior wall of the vessel, close to the semilunar valves, there sprung an aneurism which had attained nearly the size of a tennis ball; it may be said to have arisen from one of the sinuses of Valsalva. In its posterior wall there was a rounded opening, through which a goose quill could be passed. This aperture established a communication between the aneurismal sac and the right side of the heart, for the opening conducted into the conus arteriosus of the right ventricle, immediately below one of the semilunar valves of the pulmonary artery. The sac, which did not contain coagula, lay within the pericardium.

Dr. Stokes observed that he had not noticed cyanosis at any of his visits to the patient; but the resident pupil had informed him that for some short time before death there had been extreme lividity of the countenance. He further alluded to the direction taken by the aneurismal tumour, viz., downwards towards the heart, as confirmatory of the observation made by Professor R. W. Smith, so long since as 1836. In the 9th volume of the *Dublin Medical Journal*, this author has remarked that, in cases of aneurism arising from the aorta within the pericardium, or close to the sigmoid valves, there is a tendency in the tumour to pass downwards and encroach upon the cavities of the heart; and he ascribes it to the circumstance of the opening from the artery into the sac being placed within the influence of the retrograde flow of blood, both weight and impulse of which would tend to direct the tumour downwards. Numerous instances, showing the correctness of this remark, have been from time to time laid before the Society.

Dr. Stokes mentioned that the case which he had just detailed was the second which he had seen of aneurism springing from the aorta, close to its origin, simulating to a certain extent the well-known disease of permanent patency of the aortic valves.

At the request of Dr. Stokes, and with the permission of the President, Dr. Hayden made the following remarks with reference to the circumstances which had induced him to form the diagnosis of aneurism of the aorta :—

He said he had but little to add to the very clear statement which Dr. Stokes had made with regard to this extremely interesting case. If he could correctly analyse his own impressions, and it was not always easy to do so in retrospect, he might say that the impression of aneurism had existence in his mind from two sources. The first was that the murmur of exit was of a character which he had never heard in association with simple valvular disease. There had been a tendency latterly to decry the independent value of the quality of a murmur; but he had always held that this was of the utmost importance in diagnosis. The murmur of exit at the base was of a *splashing* character, or such as would result from the sudden entrance of a body of liquid into a dense-walled and resounding cavity; secondly, he inclined to the opinion that this murmur was not due to obstruction at the aortic orifice, mainly because it was not transmitted into the carotids. This seemed a point of some interest in differential diagnosis. He had not met with a single example of systolic murmur at the base, proved by dissection to be due to disease of the aortic valves in which the murmur was not distinctly transmitted into the carotids; this he regarded as a crucial test in doubtful cases. He had, however, repeatedly met with examples of basic systolic murmur, not transmitted into the vessels of the neck; but in all such cases the cause of murmur resided in the aorta itself, and not in the valves. On

the second day he examined this case he found that the changes Dr. Stokes mentioned had taken place in the interim—namely, complete transfer of fremitus from the base to the apex of the heart. On the second day, likewise, the murmur that had existed at the base at the date of the first examination, was no longer audible there, but was now to be heard at the apex with undiminished intensity, and unaltered character, according to his judgment. This seemed to him a confirmation of his original view, for he could not, on any other assumption, comprehend the sudden and complete transfer of the thrill and murmur from the base to the apex of the heart; he could not, in short, reconcile these two facts with any other view save that of aneurism. Of course the diagnosis was rather presumptive than positive—that is to say, that perfect confidence was not felt which one experiences in dealing with familiar facts, but which the rarity and eccentric character of the phenomenon here precluded. With the above reservation, the diagnosis was, great dilatation and advanced atheromatous transformation of the aorta, and aneurism of the aorta in the vicinity of the valves, establishing a communication with one of the ventricles of the heart.—*February 18th*, 1871.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COLLEGE OF PHYSICIANS.

Dr. Banks, President.

On a Case Simulating Typhoid Fever. By Thomas W. Grimshaw, M.D. (Dublin); Fellow of the King and Queen's College of Physicians; Physician to Dr. Steevens' and Cork-street (Fever) Hospitals; Lecturer on Materia Medica in Steevens' Hospital.

Thomas L., aged twenty-four years, labourer, was admitted into Dr. Steevens' Hospital on March 23rd, 1871. Had been three or four days ill before admission. March 24th, day after admission, he presented all the symptoms of typhoid fever. He had copious diarrhœa, the discharges being of the character usually seen in typhoid; pulse 120; temperature 103°·5 Fahr.; tongue whitish in centre, with intense redness at edges and tip; tenderness in right iliac region; no spots could be discovered; slight tympany over whole abdomen. Ordered a mixture containing sulphuric acid and morphia; turpentine stupes to abdomen; and chloral, twenty-five grains at night.

On the 25th all the foregoing symptoms were present; the diarrhœa

was diminished; and some rose spots, disappearing on pressure, were discovered on the chest and abdomen; I did not count them, but I noticed three distinctly on the abdomen. The patient had slept, and on the whole appeared to be going on well. As the tenderness in the right iliac region had not decreased, I ordered a blister to be applied to that locality.

On the 26th the patient expressed himself better, but all the symptoms of yesterday continued. On the 27th I saw him in the morning, when he was much the same as on the previous day.

In the afternoon of this day he was seized with sudden pain in the abdomen; great increase of tenderness; legs were drawn up; the patient was not absolutely collapsed. Large doses of opium and stimulants were given, but he died in a few hours with symptoms of perforation of the intestine. On *post-mortem* examination the abdomen was found to be considerably distended with gas. On opening the cavity of the abdomen some fluid mixed with fæces escaped. A considerable amount of peritonitis was present, and some coils of intestine were glued together with lymph of a very soft consistence, and easily broken down. On removing the intestines the lower part of the ilium was found to be much inflamed; in one spot an ashy grey appearance was presented, which looked like gangrene, but proved not to be so. Having laid open the intestine through its whole length, I failed to discover any perforation, but noticed many patches of excessive redness in the lower part of the small intestine, these patches not being confined to the glands usually affected by typhoid, but nothing distinctively ulcerative until I examined the ramiform appendix, which was found to be ulcerated and perforated, thus accounting for all the mischief. In the site of the ulcer there lay a small body in shape and size resembling an orange pip. On examining this body[a] I was rather puzzled. On section I found it was laminated in structure; and on microscopic examination I observed starch granules, mucus, and some leaf-like substance. Wishing to have a more experienced opinion I submitted it to my friend Professor Wright, by whom it was examined, and again more minutely by Professor Dyer of the College of Science. It was now found to be a concretion composed chiefly of phosphate of lime and vegetable matter, among which Professor Dyer detected portions of leaves.

I look upon the foregoing case as one of considerable interest, as it presented all the symptoms of typhoid, but after death none of the specific lesions of that disease could be discovered, nor indeed any distinct ulceration except in the seat of the perforation.

I was so firmly convinced that this case was one of typhoid that

---

[a] A portion of the foreign body, together with the inflamed and perforated portion of the intestine, was exhibited to the Society.

I wrote it down as such on the patient's bed ticket, and when death occurred, as there was some doubt as to the possibility of obtaining a *post-mortem* examination, I wrote after the disease death from perforation. I also used the case as one illustrative of typhoid fever for my class, noticing to my pupils the absence of the spots on the day of admission, and stated we might expect to find them at a future visit. The question of course arises, was this a case of typhoid fever (traumatic typhoid, if we may use the term), or was it simply a case of mistaken diagnosis. I believe it was a mistake of diagnosis on my part, yet at the same time I do not see how, under the circumstances, this could have been avoided.[a]

In conclusion I may observe that I believe great information may be obtained, and valuable discussion elicited by the bringing forward of cases of mistaken diagnosis. Indeed I believe such cases are often more instructive than those where our diagnosis has been correct.

PROCEEDINGS OF THE DUBLIN OBSTETRICAL SOCIETY.

THIRTY-SECOND ANNUAL SESSION.

Dr. Kidd, President.

Abstract of a Paper on Sudden Death after Parturition, by Dr. Thomas More Madden.—The author commences by saying the causes of this lamentable accident are manifold: some cases appear to have occurred from the shock of difficult labour acting on a delicate constitution; others from the entrance of air into the open uterine sinuses; others from cardiac disease; in other cases, again, no cause whatever was disclosed by pathological investigation for the fatal event. The most frequent cause of sudden death after labour, according to Dr. More Madden, is thrombosis or embolism, or the separation of fibrine from the blood within the circulation. In the puerperal state the blood, as well as during pregnancy, contains a marked excess of fibrine as well as on serum, and a diminished quantity of red corpuscles. Moreover, during the puerperal state the blood is otherwise altered from its normal condition by the admixture of the products of the physiological changes

---

[a] In the debate which followed the reading of this case, Drs. Duncan and Kennedy expressed their belief that this was a case of typhoid fever of too short a duration to develop the specific intestinal lesions, and that the impacted body was an accidental implication. I cannot agree in this opinion, and believe if the case had been really one of typhoid some lesion of the intestinal glands would have been discoverable.

which are then going on in the uterus. Under these circumstances the formation of coagula may be readily favoured by anything that may derange the balance of the circulation ; and this exciting cause may, in many of these cases, be found, observed Dr. More Madden, in the vascular excitement of difficult parturition, where a small fibrinous coagulum may be forced from the right ventricle into the pulmonary artery, and this remains until, by successive additions of fibrine, the calibre of the vessel is completely obstructed, and death necessarily and suddenly ensues.

The cause of death in two of the cases narrated by Dr. More Madden was very peculiar, and, as far as is known, is not mentioned by any other writer.

Dr. More Madden then proceeded to relate the particulars of five cases of sudden death after labour which had come within his own observation. Four of these occurred in the hospital with which he was connected (the Rotunda), and one occurred in private practice. In one case death was caused by extensive sloughing of the uterus, which was thus completely separated from the vagina ; in one it resulted from the entrance of air into the uterine sinuses ; in two from fatal syncope ; and in one very remarkable case from rupture of a varicocele of the left ovarian vein.

PART I.

ORIGINAL COMMUNICATIONS.

———◆———

ART. X. — *Lessons from Surgical Practice.* By B. WILLS
RICHARDSON, F.R.C.S.I.; Examiner in the Royal College of
Surgeons, and Surgeon to the Adelaide Hospital, Dublin.

I. CANCER OF RIGHT TONSIL, AND CARIES OF THE CONDYLES,
AND BASILAR PROCESS OF THE OCCIPITAL BONE.

II. DOUBLE COMPLICATED HARE-LIP AND LANGENBECK'S OPERA-
TION.

III. AMPUTATION BY THE CIRCULAR METHOD, AND COMPRES-
SION OF THE FEMORAL ARTERY WITH THE PRESSE–ARTÈRE.

IV. EXPERIMENTAL TESTING ON THE RAPIDITY OF IODINE
ABSORPTION.

V. AMPUTATIONS AT THE KNEE.

VI. MODIFIED AMERICAN APPARATUS FOR THE TREATMENT OF
FRACTURE OF THE FEMUR.

VII. OBLIQUE FRACTURE OF THE RIGHT FEMUR AT ITS MIDDLE
THIRD.

VIII. WATHEN'S FORCEPS FOR CUTTING STARCH BANDAGES.

IX. FRACTURE OF BOTH BONES OF THE LEG.

X. NÉLATON'S SPLINTS FOR FRACTURE OF THE LOWER END OF
    THE RADIUS.

*Cancer of Right Tonsil with Suppuration; Caries of the Condyles
    and the Basilar Process of the Occipital Bone; Hæmorrhage into
    the Larynx and Trachea, causing instantaneous Death by
    Apnœa.*

Louisa T., aged sixty-four years, widow, was admitted into the
Adelaide Hospital, on 16th Sept., 1869.

Several years previously she suffered from pain in and partial
loss of power over the right arm. These symptoms soon ceased,
and her health continued good until Christmas, 1868, when she
was seized with shooting pains in the right ear and right side of
head and neck. Matter came from the ear, and deafness ensued.
The right nostril became "stuffed," and smelling impaired.

Her mother died when she was a girl, but the father lived to
very old age. Her brothers and sisters were then alive and
healthy.

When admitted to hospital she had a very rapid pulse, and the
countenance was expressive of anxiety. The skin was of a dusky
hue.

There was no tenderness in any portion of the spine. Its
absence, however, would have been a very fallacious negative sign.

A careful examination of the fauces did not reveal any evidence
of disease. Relief followed the treatment prescribed, and she left
hospital on the 10th March, 1869.

Six weeks before re-admission she experienced difficulty in swal-
lowing, solids particularly, and the painful symptoms recurred that
I have described; but her symptoms on the 16th Sept., were as
follows :—(1.) Stuffing of the right nostril. (2.) Pains in the right
side of the head, and occasionally very severe pains in the vertex,
the right side of neck, and in the right arm. (3.) Complete deafness
of the right ear, the hearing with the left one being very imperfect.
(4.) Tenderness to pressure in the upper and posterior cervical region.
(5.) Brownish purulent discharge flowed from the right naris into the
pharynx. (6.) The right tonsil was almost the size of a walnut,
was of stony hardness and very fixed. The half of the soft palate

corresponding to it seemed to form part of the tonsil, and was much thickened and abnormally vascular. (7.) The uvula, as in ton-silitic abscess, sprang as it were from the tumour, and was pushed over to the left side. Thus the palate, tonsil, and uvula formed a single mass which appeared to be continuous, with a fixed, hard, slightly prominent and defined swelling situated upon the front and right halves of the bodies of the two or three upper cervical vertebræ. The tonsilitic portion of the first described tumour was ulcerated. The laryngoscope as well as the finger proved that the epiglottis was displaced to the left side. Pulse 92. Tongue white and furred. Ordered a mixture of bromine, distilled water, and syrup.

21st Sept.—The dose of bromine was increased.

5th Oct.—Great pain and tenderness in the right side of frontal bone, in front of the coronal suture. Severe pain, also, in the right side of the neck and in the right shoulder. Inability to rotate the head. A small, very hard, and tender gland could be felt a little below the angle of the right side of the lower jaw. Pulse 80. A hypodermic injection, proportioned as follows, was given at the right side of the neck :—$\frac{1}{6}$ gr. acetate of morphia and $\frac{1}{120}$th gr. of sulphate of atropia, in six minims of fluid.

6th Oct.—Vomited several times after the hypodermic injection. Pain confined to the ear.

7th Oct.—Recurrence of pain, and repetition of the hypodermic injection.

8th Oct.—Vomited once after the hypodermic injection. Ordered one minim of bromine in solution three times daily.

21st Oct.—Neuralgic pains very severe on the evening of the 8th Oct. in the right side of head, face, and neck, necessitating the repetition of the morphia and atropia hypodermic injection. She vomited afterwards, but she had a good night. On this day (21st October) she had headache, a hot skin, and the pulse was 106. Tongue dirty. Ordered the hospital diaphoretic mixture. Bromine discontinued.

25th Oct.—Dyspnœa. Fine crepitating râles in lower and posterior part of each lung, with corresponding dulness on percussion. Pulse 120; skin very hot; tongue yellow and moist. Ordered the turpentine stupe to posterior part of chest morning and evening.

1st Nov.—The crepitating râles in the lungs were coarser, and

the dulness had not extended. Excruciating pain in vertex, right side of neck and right shoulder. The hypodermic injection was repeated.

2nd Nov.—Several vomitings followed the hypodermic injection of the day before, but pain was much relieved.

3rd Nov.—The pharyngeal tumour was larger, redder, and the ulceration of its surface had extended. Ordered a biborate of soda lotion for the mouth.

9th Nov.—She had comparative ease until the night of the 8th, when the breathing became difficult. Fig. 1 represents the tumour

Fig. 1.—Cancer of Right Tonsil. Louisa T., aged 64 years.

as it appeared on that day. The gland below the angle of the right side of jaw was bigger, very hard, and immovable. Pain only in the vertex. Pulse 120, and small. Ordered to breathe the vapour of bromine mixed with steam from hot water.

15th Nov.—Tumour deeply ulcerated on its surface.

11th Dec.—The tumour gave way, and, according to the nurse,

some pus was discharged.   An extensive chasm was formed thereby.   Barely a trace of the soft palate was to be seen, and the right tonsil had completely disappeared.   Pulse 110, and very small.

15th Dec.—The voice and hearing had improved since the tumour gave way.   The pharyngeal excavation enlarged by ulceration.   The spinal tumour, which had appeared to be continuous with the tonsilitic one, was again visible.   It was oval in form, and most prominent corresponding to the third cervical vertebra.   Disgusting fetor from the mouth.   Two or three very hard glands below the gland near the angle of the jaw.   Submaxillary glandular region indurated and swollen.   Pulse 116, and weak.   Being annoyed by a cough, she was ordered a polygala mixture with camphorated tincture of opium.

19th Dec.—Pulse 120, and weak.   The wall of the pharyngeal excavation was secreting dirty-looking matter, but fetor was subdued by a permanganate of potash mouth wash.   The tumour in relation with the upper cervical vertebræ had doubled in size since the 15th.   Submaxillary glandular region harder, more tumified and fixed.   A small indurated gland under the skin below this part, a little above the right cornu of the *os-hyoides*.   Voice and hearing improved.

23rd Dec.—Features more pinched.   The ulcerated margin of the excavation had become of stony hardness.   She suffered greatly from thirst.

27th Dec.—Skin icteroid in colour, and there was a good deal of discharge from the left nostril.

5th Jan.—Pulse 130.   Countenance more anxious.   Eyes and cheeks sunken.

11th Jan.—Pulse 124.   Was seized with a rigor the previous night, which was followed by a very hot skin.   Left cheek wore a hectic blush.   Tongue dry and brown, but she was unable to protrude it.   Great pain in the cervical vertebræ when the neck was stirred.

12th Jan.—She was suddenly seized with hæmorrhage at one o'clock a.m.   The blood flowed from the nostrils and mouth.   It also passed into the larynx and trachea, causing almost instantaneous suffocation.

Previous to the *post-mortem* examination, I thought it possible that the oval tumour might have been a post-pharyngeal abscess. It proved, however, to be a semi-solid tumour, and was amalgamated with the upper constrictors of the pharynx.

I regret that I was unable, for reasons unnecessary to mention, to make a careful microscopic examination of the parts engaged in the disease, and therefore must limit myself to their description as they appeared to the unassisted eye.

The post-mortem.—The right half of the soft palate and the greater part of the uvula had disappeared, the remainder of the uvula being attached to the left half of the soft palate.

There was not a vestige of the right tonsil or of the right palato-glossus and palato-pharyngeus muscles. On the ulcerated floor of the excavated tonsilitic space several arteries were exposed, one of which, a little larger than a crow quill, had been opened by ulceration, and was the source of the fatal hæmorrhage. Contiguous to these vessels there were several indurated glands, the largest having a long diameter of half an inch.

In front of the bodies of the first, second, and third cervical vertebræ there was an oval firm swelling, its greatest diameter being three-quarters of an inch. This tumour was amalgamated with a portion of the superior constrictors of the pharynx. The upper portion of the superior constrictor to the right of the swelling was destroyed by ulceration.

The cervical vertebræ were healthy, excepting the anterior lips of the superior articulating surfaces of the atlas, which were slightly carious. Nearly all the circumference of the right condyle of the occipital bone was stripped of cartilage, and the condyle itself was rarified and undermined by carious action. A very small portion of the left condyle of this bone was still continuous with the process from which it sprang; the remainder of it was detached and reduced in size by caries, a few fibrous bands forming its only connexion with the bone.

The margin of the foramen magnum anterior to the condyles was roughened by commencing caries, and the same action destroyed the lower half of the basilar process.

Although Louisa T. at an early period of her clinical history had symptoms that might be referred to irritation of the spinal cord, yet they rapidly subsided, and she enjoyed " good health " for some time. The next symptom was the enlargement of the right tonsil, and this was followed by symptoms again referable to irritation of the upper portion of the spinal cord.

Bearing in mind the history of the tonsilitic enlargement, its stony hardness, the stony hardness of many of the glands in the neck, the stony hardness of the margin of the pharyngeal

excavation, the complete destruction of the tonsil and of half the soft palate, I have been led to believe that the tumour formed by the tonsil was a malignant one, in which suppuration had occurred when it was fully developed.

Double Complicated Hare-lip; Failure of Union from first Operation; Subsequent Partial Union by Granulation; Excellent Results from second Operation by Langenbeck's Method.

There are few surgeons of experience in hare-lip operations who have not occasionally had cases of hare-lip in which there was failure of union after one or even more operations   To me it is surprising that writers who have met with cases of this kind should have so frequently confined themselves to the reporting of those in which union occurred, and have withheld all information regarding the others.

Acting upon the principle that it is our duty to lay before the student the shortcomings as well as the triumphs of nature, I record the following case, in which, from some mysterious cause, she failed to assist art after a first operation; but successfully and rapidly assisted our efforts after the second.

Case.—Mrs. B. brought to me her infant Charles, aged five weeks, to have its hare-lip remedied by operation, which she wished to have performed at once, the deformity being to her eyes so hideous.

The labial and osseous tubercles, formed by the intermaxillary bone and the central portion of the lip, projected obliquely from the tip of the nose, and were twisted to the left side, exposing the deep oral chasm, and hiding from view almost the whole of the left half of the lip (Fig. 2).

The nasal septum was obliquely directed to the left side, thus giving the oblique direction to the tubercles attached to it.

The hard palate and the velum being engaged in the division, the buccal region, nasal fossæ, and pharynx formed a single, relatively speaking, large cavity.

Suction being impossible, spoon-feeding was substituted for it; a troublesome process, on account of the upward regurgitation of the food.

The child seeming to be in good health, I performed the operation, assisted by my colleagues, on the 27th November, 1869. It was then six weeks old.

Having dissected the labial tubercle off the osseous tubercle, and

partially divided the neck of the latter with one of Butcher's cutting hare-lip forceps, I forced this tubercle into its normal position between the separated maxillæ. It was not deemed advisable to pare its sides or those of the maxillary gap, the tubercle being merely sufficient to fill it.

The sides of the labial tubercle having been pared to a triangular shape, with its base above, and each side of the lip "freed," the edges of the cleft were then pared to the ordinary curves. They were brought and maintained together with a couple of twisted sutures. However, before the uppermost needle was inserted, the labial tubercle was pushed upwards that the tip of the nose might be depressed as little as possible, and that it might also assist in forming the lower part of the nasal septum. Its apex was secured between the edges of the cleft by the upper needle. The red edges of each side of the lip were secured in contact with a very fine silk interrupted suture. Collodion was applied to the lip and over the sutures.

30th Nov., 11½ o'clock, a.m.—The upper needle passage was widely ulcerated, and rendered the needle useless; consequently it was withdrawn. No union whatever between the edges of the cleft. I again secured them in apposition, but on this occasion with a fine silk ligature passed beyond the ulcerated needle openings. The truss known in England as Hainsby's was then put on.[a] Indeed, were it not that the mother urged for an immediate operation and could not brook delay, I would have waited until I

---

[a] Sir William Fergusson mentions that Hainsby's truss was brought under his notice many years ago by Hainsby himself, who designed it to apply to the face of his own child, who had been operated on twice unsuccessfully, once by the practised hand of Mr. Liston. Long prior, however, to the period referred to, his friend, Dr. Dewar, of Dunfermline, had advantageously applied a similar contrivance to several bad cases of double hare-lip which came under his care.—A System of Practical Surgery. By Sir William Fergusson, Bart. Fifth edition. London, 1870.

The hare-lip cheek compressor so ingeniously perfected by those gentlemen is a very old invention. De La Faye mentions that "Verduc and La Charrière recommend the use of a serre tête for approximating, by compressing the jaws, the divided soft parts and retaining them approximated; it is a kind of steel circle, slightly elastic, that ladies use." The spring was passed over the head and the two ends were applied to the jaws." He also mentions that M. Quesnay preferred whalebone. Quesnay, instead of passing the whalebone over the head, adapted it to the nape of the neck, the ends being applied to the lip at the alæ of the nose. He assisted the action of the whalebone with plaster and bandage. Quesnay cured a hare-lip with his apparatus, in which one of the needles had failed, and left at the lower part of the cleft a tear scarcely allowing of the insertion of another needle.—Mémoires de l'Académie Royale de Chirurgie. Tome Premier. A Paris, 1761.

had procured my truss, which had been mislaid. However, as the result proved, it was powerless in favouring immediate union after this operation.

2nd Dec.—Union had also failed to take place between the lower portions of the sides of the cleft. The lower needle, likewise, had lost its command over the lip from ulceration of its passage. I removed it and brought the edges together with a silk interrupted suture. The use of the truss was continued.

4th Dec.—The ligatures had lost command of the lip from rapid ulceration of their tracks. It was now ascertained that union to the extent of only the eighth of an inch had occurred between the left half of the lip and left side of the labial tubercle. The intermaxillary bone remained between the upper maxillæ.

Four soap plaster straps of sufficient length to allow of their terminating on the cheeks, and having a width of half an inch, excepting where they crossed the lip, and were reduced to a width of a quarter of an inch, were applied in the following way:—The centre of each strap was applied to the lower and back part of the head, from which the downy hair had been removed, and the ends were brought forward so as to cross one another over the cleft, and with traction sufficient to bring its edges together. The use of the truss was continued. After the case had been managed thus for a few weeks, the lower portion of the left side of the labial tubercle, which had ascended a little, completed its union, by means of the granulating process, with the corresponding part of the left edge of the cleft. In January, 1870, the case was in this way reduced to a single cleft at the right side. The intermaxillary bone had cut an incisor tooth, which, projecting forward and irritating the lip, was extracted. In consequence, however, of the almost complete failure of primary union, I determined to postpone operating upon the remaining cleft for a few months. The child, accordingly, returned to the country with its mother, who was instructed to apply the truss for a few hours every day, with the view of partially closing the cleft by its action upon the cheeks, and thereby place the lip in a better condition for assisting the sutures of the second operation.

6th June, 1870.—I operated by Langenbeck's method[a] on the

---

[a] This is a modification of Malgaigne's operation, which consists in separating a strip from each edge of the cleft by carrying two incisions from above downwards, towards, but not through, the free margin of the lip. The two upper thirds of the strip are then cut away, and the lower third pressed downwards and united, forming

lip. The left edge of the cleft was simply pared as he directs, and the right edge was cut after Malgaigne's plan. The straight edges of the cleft were retained in apposition with a couple of twisted sutures, and the little piece of lip was secured with a fine silk ligature to the refreshed curved portion of the left side of the cleft. Those steps were barely completed when breathing became difficult, the skin livid, then pallid, and death by apnœa seemed so imminent I at once removed the needles. The smallness of the oral opening, combined with rigidity of the lip from the presence of the twisted sutures, caused those alarming symptoms.

In a few moments after removal of the needles, and the front of the chest had been rapidly rubbed, breathing became again natural, and I was enabled to substitute two silk interrupted sutures for the needles. The truss was then applied.

Immediate union followed the operation, but the truss was used for some days until the cicatrix became very firm.

In August, 1871, I had a drawing (Fig. 3) made of the child's face by Mr. Burnside. It shows an unflattened nose, which I attribute to the gradual ascent of the labial tubercle during the granulating process. Notching has been prevented by the projecting downwards of the little flap brought over from the right edge of the cleft to the part of the left edge that had been prepared for its reception.

The great improvement in the appearance of the child is still more evident when it laughs, for then the central downward projection is very distinctly seen. The upper jaw-bones have come together, the intermaxillary bone being situated between them in front. They have (26th Aug., 1871) cut two teeth, one being just at each side of the intermaxillary bone, but the latter has not cut another tooth since the one that was extracted. The lower jaw has cut six teeth in front. The voice is so improved that the child is beginning to articulate distinctly.

---

a projection downwards. The objection is, that infants are apt to suck at the small protuberance remaining at the inferior angle of the united fissure, and loss of blood may thus take place. The method of Langenbeck, as Mr. Samuel Lane observes, is perfect in this respect, especially when the fissure is lateral. One side is pared simply, the lower end of the cut curving outwards ; the other side is pared almost after Malgaigne's method, and the lower free border, which is not removed, passes over the median line for some distance, and is united with the opposite border. The cicatrix is thus vertical at the upper part and oblique at the lower part, and no contraction of the cicatrix can lead to notching or indentation of the free border of the lip. —Cooper's Surgical Dictionary, eighth edition, Vol. i., p. 870.

Both foreign and English surgeons are much divided in opinion as to the most suitable age for the performance of the hare-lip operation; and some of those who advocate the operation soon after birth in single hare-lip, recommend delay when there is the double deformity.

Fig. 2.—Charles B. previous to operation.

Fig. 3.—Charles B. after second operation.

Non-union after operation, for aught I know, from the absence of positive information on the subject, may be equally frequent

in the ordinary varieties of hare-lip. Sir William Fergusson speaks
of non-union only in the single cases; but it is probable his obser-
vations are intended to apply to both kinds of cases. " In general,"
he says, " there is little trouble with single hare-lip, although every
now and then, either from scantiness of tissues, or from some more
incomprehensible cause, the union is not accomplished."[a]

For my part, when the general health of the child appears good,
I am inclined to think the operation, even in the double compli-
cated cases, should not be delayed many weeks after birth, and for
the following reason :—

Dieffenbach has observed, and in this he appears, according to
Mr. Lane, to have been confirmed,[b] that more infants are born
with double than with single hare-lip; and that the fact of more
single than double hare-lip operations being recorded is accounted
for by the great mortality in the double cases. This mortality
may, to a great extent, be referred to the largeness of the chasm
or oral cavity allowing, in the complicated cases, of unwarmed
inspired air to pass too freely to the lungs. To my mind this is
a cogent argument in favour of early operation in complicated
cases, where fatal chest affections, for the reason just mentioned,
are so liable to happen.

*Amputation by the Circular Method at the Junction of the
Middle with the Lower Third of the Thigh; Femoral Artery
compressed with the Tubular* Presse-artère, *one vessel twisted;
Carbolic Acid Treatment of the Stump; Recovery; Rapidity of
Iodine Absorption.*

The notes of this case I record because it was the first in which
I used the *presse-artère* on the femoral artery. It may, moreover,
be of use statistically in the question as to the comparative safety
of amputations through the thigh; at the knee; and excision of
the knee-joint.

CASE.—Charles A., aged thirty-one years, was admitted into the
Adelaide Hospital, on the 31st May, 1870.

Five years previously an abscess formed in the right side of the
neck, and was opened. The sac eventually closed. His health
was so far restored, that he remained well for three years, when
the right elbow-joint inflamed, suppurated, opened spontaneously,

---

[a] Cooper's Dictionary, p. 501.   [b] Ibid., p. 868.

and discharged pus for eighteen months. It then anchylosed. Not long afterwards the right knee became excessively painful, and when moved was the source of intense agony.

Repeated blistering does not appear to have had any influence in arresting the articular disease, for it steadily progressed and caused such impairment of health that he sought for hospital relief.

He had on admission nocturnal perspirations, a rapid pulse, and he was very thin. The kidneys were healthy.

The right elbow-joint was anchylosed nearly at a right angle. The upper two-thirds of the calf of right leg were swollen from the presence of an abscess that was pointing internally. The right knee was enlarged, globular in shape, and fluctuated. The tibia and fibula were partially dislocated outward and backward, the thigh and leg forming an angle, salient internally at the knee. Very slight flexion of the joint caused great suffering; but he could, by means of a sling, and by using great caution, raise the limb *en masse* from the bed.

I opened the abscess at the inner side of the calf and discharged a large quantity of grumous matter.

Ordered cod liver oil; a mixture of infusion of quassia with sulphate of iron; full extra diet.

4th June.—Sweating having increased, the quassia mixture was changed for one containing sulphate of quinine with an excess of dilute sulphuric acid.

6th June.—The pulse had become very frequent.

7th June.—Erysipelas appeared upon the right leg and the lower half of the thigh, and may have been the cause of the sudden rise in the pulse. The redness had not a defined margin. The erysipelatous parts were much swollen, and there were three or four large bullæ, with amber-coloured contents on the inside of the leg; the abscess discharged profusely; fluctuation in knee was more decided; pulse 140; tongue natural. Ordered 8 ozs. wine; XX porter; twenty drops of muriated tincture of iron every second hour instead of the quinine mixture.

8th June.—Pulse 140; skin hot; tongue natural; erysipelatous redness fading; much grumous discharge from the calf. Knee-joint very distended and painful; I opened it, and gave exit to the characteristic matter of struma—viz., the whey-like fluid with flakes of pus. Ordered Liebig's meat essence and whiskey gruel. The joint to be poulticed.

9th June.—Pulse 112; tongue natural; erysipelas more faded;

and the bullæ had broken and dried; knee not so swollen; I opened another grumous abscess that was in the calf of the leg.

10th June.—Pulse 104; tongue natural; erysipelatous redness had nearly disappeared; a good deal of grumous fluid with curdy flakes was coming through one of the openings in the leg; startings of the limb when he was falling to sleep. Same treatment, with the addition of an anodyne nightly.

11th June.—Pulse 130; profuse grumous and purulent discharge from the leg. Wine increased to 10 ounces. Whiskey gruel as usual.

12th June.—Pulse 128; tongue natural; discharge from the leg still profuse but not so grumous; the erysipelatous induration of the thigh less. Recurrence of night sweating. I syringed the abscess cavity with Condy's fluid.

13th June.—Pulse 113, a degree fuller; tongue continued natural; abscess cavity treated in the same way. Diet and medicine continued.

14th June.—Pulse 104; tongue natural; abscess sac syringed with carbolic acid, glycerine, and water. Same diet and medicine.

17th to 20th June.—Pulse 120; decrease of suppuration. Nightly recurrence of perspiration. Ordered, instead of the muriated tincture of iron, a mixture of sulphate of quinine, sulphate of iron, dilute sulphuric acid, and water.

23rd June.—The greater portion of the leg, and the knee-joint, being to all appearance disorganized, my colleagues agreed with me in opinion that amputation should be performed at once, notwithstanding the persistence of the erysipelatous induration.

I amputated by the circular method, during chloroform anæsthesia, at the junction of the middle with the lower third of the femur. Two arteries only required hæmostatics—the femoral and a smaller vessel. To the femoral I applied my tubular *presse-artère*, and I twisted the other artery. The edges of the wound were secured together by twisted sutures, the needles being long. The end of the stump was covered with a thick layer of carbolic acid cream.[a] When in bed he was given a full opiate, and the usual mechanical precaution was taken to prevent "stump startings." Ordered to have 12 ounces of wine and 2 ounces of whiskey in the 24 hours. Full diet, with Liebig's essence, and an egg.

24th June.—Pulse from 96 to 108; tongue natural; end of

[a] For its composition see the November number of this Journal, 1869.

stump syringed with carbolic acid, glycerine, and water. It was then covered with the carbolic acid cream. Ordered a mixture of infusion and tincture of cinchona, with tincture of veratrum viride. Same diet.

25th June.—Pulse 96 to 104; tongue natural; neither fetor nor discharge from the stump; *presse-artère* in its place. Stump managed in the same way. Mutton chop added to his diet.

26th June.—Pulse 96 to 104; tongue natural; no suppuration; two-thirds of the cut skin agglutinated. Stump syringed with carbolic acid, glycerine, creasote, and water, and then covered with the carbolic acid cream. Same diet and medicine.

28th June.—Pulse 112; I removed, without loss of blood, the *presse-artère* off the femoral artery, being the 122nd hour since the amputation. Two of the twisted suture needles were likewise removed. Stump treated in the same way.

30th June.—Pulse 112; stump more consolidated; suppuration in small quantity from the granulations at the margin of the stump wound, and yet this was the part to which the carbolic acid was almost uninterruptedly applied.

4th July.—Slight suppuration from one of the needle holes. Same management of stump.

16th July.—Pulse 90 to 104; no suppuration since the 4th.

17th July.—Pulse 104; suppuration in small quantity from the inner end of stump wound.

18th July.—Suppuration barely perceptible; he was so improved in general health the wine was reduced to 8 oz. daily.

25th June.—Out of bed every day since the 21st; a small abscess was forming at the inner end of stump cicatrix.

26th July.—Pulse 100; the abscess opened spontaneously.

5th Aug.—Pulse 90; the stump being healed he was sent to the Stillorgan Convalescent Home, where he remained a month.

As soon as the stump had ceased to waste, a pin-leg was procured for him, and he returned home in excellent condition and spirits.

If it be true that a relationship exists between erysipelas and blood poisoning (pyæmiá?), the escape of the patient from septic contamination of the system is remarkable, the erysipelatous infiltration of the soft parts implicated in the operation being at the period of its performance only partially absorbed. We had no choice, however, unless amputation at the hip were performed, which we did not consider justifiable. Moreover, he appeared to

be in a state so critical as not to warrant a further postponement of the operation.

I need not fully detail the condition of the knee-joint, and will merely observe that the articular surfaces of the patella and tibia were completely deprived of cartilage, as well as those of the femoral condyles, with the exception of a small portion of the inner condyle. Stalactitic deposits were developed on some parts of their denuded surfaces. They were rarified internally, and resembled coarse sponge in appearance. Two openings in the outer condyle led to cavities in the rarified bone tissue. The femur was diseased for three inches and a-half from the surface of the condyles upwards.

The front half of the outer condyle of the tibia was disintegrated and partially removed. This part communicated with a small cavity in the diseased condyle. Indeed the whole thickness of the bone was diseased down to the tuberosity, which was itself enlarged by " pumice stone" deposit.

The muscles of the calf were disorganized from the knee to near the tendo-achillis.

Experimental Testing on the Rapidity of Iodine Absorption.

Charles A., the above patient, re-appeared at the hospital on the 27th April, 1871, with a large abscess partly corresponding to the site of the right great trochanteric bursa. It was unconnected with the end of the stump. When opened, a large quantity of synovia-like fluid, mixed with pus, was discharged. He suffered from night perspirations, and the pulse ranged from 90 to 112.

After he had been a little time in hospital I commenced injecting the sac with tincture of iodine, and tested the urine to ascertain how soon the iodine could be demonstrated in it.

The re-agents employed were starch and nitric acid.

The urine was tested immediately after each injection; but I will give only the particulars of the occasion on which the iodine was soonest detected in it.

A catheter having been passed into the bladder, one of our pupils held the handle, and occluded the orifice with one finger, that there might be no delay in withdrawing the urine required for each testing. The abscess sac was next injected with $1\frac{1}{2}$ ounce of tincture of iodine.

The first indication of the presence of the iodine in the urine was not apparent until 30 seconds after the injection. In one

minute the violet reaction was more decided; and in one minute and a half it was very decided.

The iodine sometimes rapidly disappeared from the urine. For instance, on one occasion, the violet reaction was extremely decided the fourth minute after the injection, and in one minute more not a trace of iodine could be detected.

The local treatment of the sac with the tincture of iodine caused an apparent diminution of its area. The patient's general health, notwithstanding, appeared to suffer from the hospital atmosphere, and he was sent to the Convalescent Home, whence he returned to his residence in the country.

AMPUTATIONS AT THE KNEE.

The amputations by long anterior flap at the knee-joint, through the femoral condyles, and immediately above them, having received a good deal of attention within the last few years, it may not be out of place to prelude the case of amputation through the condyles, herein described, with a few observations on the history of the long anterior flap amputation of the thigh; the long anterior flap principle having been applied to amputation of the thigh by Benjamin Bell, whose name in connexion with it has been ignored by some recent surgical writers.

Amputation of the thigh by anterior single flap[a] being to some extent identified with the Irish School of Surgery—Bell having graduated in the Dublin College of Surgeons—is a further incentive to these observations.

It is but just to mention that Sédillot, several years ago, recognized the value of amputation by single flap, and connected Bell's name with it. Sédillot, however, wrote in favour of generalizing this method, applied by Bell to the thigh only.

In the year 1788 Bell described in the sixth volume of his " System of Surgery," the amputation above the knee by anterior single flap.[b] Whether or not he took the hint from James Young's single skin flap operation, published by him in 1678, and which he himself had from Lowdham, whose first flap amputation was by single flap at the leg, I cannot, of course, conjecture.

[a] Benedict, Textor, and Jaeger formed, in thigh amputation, the single flap from the outside ; Zang and Textor from the inner side ; Hey and Little (Sligo) from behind.—Chelius, System of Surgery. By John F. South. London, 1847. Vol. ii., p. 909.

[b] Le Gras and Fouilliay, also, advocated amputation of the thigh by anterior single flap. They were preceded by Bell.—Chelius. ibid.

Bell describes the anterior single flap amputation of the thigh as follows:—

" The patient being placed upon a table, the tourniquet being applied in the usual way at the top of the thigh, and the teguments drawn firmly up and retained by an assistant, the extent of the intended flap should be marked with ink.

" The extreme point of the flap should reach to the end of the limb, unless the teguments be in any part diseased, in which case it must terminate where the disease commences, and its base should be where the bone is to be sawn. This will determine the length of the flap; and we must be directed with respect to the breadth of it by the circumference of the limb; for the diameter of a circle being somewhat more than a third of its circumference, although it may not be exactly circular, yet, by attention to this circumstance, we may ascertain with sufficient exactness the size of a flap for covering a stump. Thus, a flap of four inches and a quarter in length will reach completely across a stump whose circumference is twelve inches; but as some allowance must be made for the quantity of skin and muscles that may be saved on the opposite side of the limb, by cutting them in the manner we have directed, and drawing them up before sawing the bone, and as it is a point of importance to leave the limb as long as possible, instead of four inches and a quarter, a limb of this size, where the first incision is managed in this manner, will not require a flap longer than three inches and a quarter, and so in proportion according to the size of the limb. The flap at its base should be as broad as the breadth of the limb will permit, and should be continued nearly, although not altogether, of the same breadth to within a little of its termination, where it should be rounded off so as to correspond as exactly as may be with the figure of the sore on the back part of the limb. This being marked out, the surgeon, standing on the outside of the limb, should push a straight double-edged knife with a sharp point to the depth of the bone, by entering the point of it at the outside of the base of the intended flap, and carrying the point close to the bone, should push it through the teguments at the mark on the opposite side. The edge of the knife must now be carried downwards in such a direction as to form the flap according to the figure marked out, and, as it draws towards the end, the edge of it should be somewhat raised from the bone, so as to make the extremity of the flap thinner than the base, by which it will apply with more neatness to the surface of the sore. The flap

being supported by an assistant, the teguments and muscles on the back part of the limb should, by one stroke of the knife, be cut down to the bone about an inch beneath where the bone is to be sawn, and the muscles being separated to this height from the bone with the point of the knife, the soft parts must all be supported with the leather retractor till the bone is sawn."[a]

Sédillot, as I have mentioned, considering that amputation by single flap has many advantages, generalized this method,[b] and, though not an advocate for the knee-joint amputation, agrees with those who recommend the formation of a long thigh stump. He speaks of the benefit to be derived from covering the stump with the integuments of the knee in amputation immediately above the condyles, an operation advocated also by Malgaigne.[c]

I cannot join Sédillot in his disparagement of the retention of the patella in this amputation. The idea of applying the patella to the sawn extremity of the femur in amputation just above the condyles he attributes to Seymanowski, who " has proposed to saw the articular surface of the patella, and apply it against the divided extremity of the femur, without touching the tendon of the triceps, to better secure direct sustentation upon the stump. This procedure," he goes on to say, " an imitation of that of Pirogoff, does not appear to us to deserve much confidence, but the idea is very ingenious."[d]

Unlike the portion of os calcis retained in Pirogoff's amputation— an operation, by-the-by, it is said he relinquished—there is, if we may judge by the recorded cases in which the patella had been retained, but small risk of its becoming diseased.

The long anterior single flap, or the long anterior and short posterior flap amputations through the condyles, with retention of the patella, should, when practicable, have the preference over Syme's modification of Hoin's method, for they present the triple advantage of forming a wound, the opening of which is narrow and of easy re-union, of placing the cicatrix quite behind the member, which secures it from injury, and, finally, of covering the condyloid extremity of the femur with the integuments of the anterior part of the knee, which are thick, hardened by habitual pressure, and

---

[a] A System of Surgery. By Benjamin Bell. Edinburgh, 1788. Vol. vi., p. 398.
[b] Recherches sur les moyens d'assurer la réussite des amputations. 1848.
[c] Manuel de Médecine Opératoire.
[d] Mr. William Stokes has had four successful cases of Seymanowski's operation.

better disposed to support the weight of the body.[a] The long posterior flap method, on the other hand, leaves a cicatrix that is liable to be drawn under the end of the bone, the worst possible position for it, and the thin skin of the calf is not so well adapted for direct sustentation as the natural kneeling skin of the front of knee.

Fig. 4.—Amputation through the Femoral Condyles, and by long posterior and short anterior flap. William Udhe, aged 20 years.

In the thirtieth volume of this Journal[b] I recorded a case in which I amputated, in the Adelaide Hospital, through the femoral

[a] Traité de Médecine Opératoire Bandages et Appareils. Par le Docteur C. H. Sédillot. Troisième édition. Tome Premier. Paris, 1865. Page 451.
[b] 1860. Page 318.

condyles, and by long posterior and short anterior flap, without retention of the patella (Fig. 4). Shortly afterwards Mr. John Morgan, then my colleague, performed two similar amputations in the hospital. The three patients made rapid recoveries. But I now think, for the reasons given in this communication, that amputation by single long anterior flap, or by long anterior and short posterior flap, at the knee, through the condyles, or immediately above them, should have the preference. The double flap operation is probably the better of the two, the great length of the single long anterior skin flap rendering its chance of sloughing greater than the shorter (but still long) flap of the double flap method.

The operation by single anterior, or rather anterior skin flap, is attributed to Mr. Carden.[a] Be this as it might, James Young's single flap operation was a single skin flap amputation; and in Bauden's elliptical amputation at the knee, the flap is an anterior skin flap taken from the front of the knee and leg.[b] The operation by single anterior, or, as Sédillot calls it, superior flap, we may again remind the reader, he endeavoured to generalize in 1848, and, curious enough, his description of its advantages is very similar to the observations of Mr. Carden in favour of the single skin flap. " I call anterior flap," Sédillot writes, " that which is cut in such a manner as to be over the stump during the treatment of the wound. It might also be named superior, which is of little consequence, when we understand the indication to be fulfilled — indication which consists in having a flap that falls over the stump by its own weight."[c] Sédillot's mortality from this method has been low. He does not form the flap in every case of skin only, but sometimes cuts a mixed flap, taking care to avoid having too great a thickness of muscle in it. " We seize widely," he directs, " the soft parts of the anterior aspect of the member, and we cut semi-circularly the integuments by an incision which comprises almost the two anterior thirds of the circumference of the thigh, and which ascends sufficiently high at each side that the flap may have a length equal to the third of the diameter of its total circumference. We raise the skin by drawing it *en masse* with the right hand, and we cut the muscles obliquely from below upwards and from before backwards, in order to

[a] On Amputation by Single Flap. By Henry D. Carden, Esq., Worcester. British Medical Journal for April 16, 1864, p. 416.

[b] Sédillot. .Ibid., p. 451.

[c] Traité. Ibid., p. 336.

avoid preserving too great thickness of them in the flap. As soon as the deep muscles have been separated from the femur, we divide perpendicularly the integuments and muscles at the posterior part of the member, and we complete the amputation on dividing the bone to the extent of a few *centimètres*,[a] to prevent its prominence at the posterior part of the wound."[b] This amputation differs but little from B. Bell's. Indeed, the same might be said of Teale's amputation; for, with the exception of the rectangular shape of the flaps, it also is almost a counterpart of Bell's amputation. The dissecting of the muscles from the bone to the extent of an inch by Bell, before the application of the saw, renders the similitude still more striking, a short flap being the practical result of this manœuvre.[c]

In many of the cases of amputation at the knee collected and recorded by Mr. Markoe, who has given much attention to this operation, the flap methods most frequently followed, were—(1) The long anterior flap and short posterior flap; (2) The long posterior flap and short anterior flap; (3) The single flap; (4) The lateral flaps.

The circular operation was performed in a few of the cases.[d]

Mr. Markoe's observations as to the most suitable cases for amputation at the knee are so much to the point and so thoroughly practical, it may not be inappropriate to introduce them here for the benefit of the junior reader.

According to him the operation is suitable in " all such injuries of the leg as approach so near the knee as to preclude amputation through the leg; all such diseases of the bones of the leg as, without involving the knee-joint, leave no sound portion of tibia available for a stump; and, lastly, a certain number of cases of diseased knee-joint, when there is reason to believe that the end of the femur is but little affected by the destructive actions.[e] . . . In cases, on the other hand, where the bone tissue is infiltrated with the strumous products of long continued disease, or where the ravages

---

[a] A centimetre is equivalent to three-eighths of an English inch.

[b] Traité. Ibid., p. 454.

[c] Mr. Wharton, President of the Royal College of Surgeons, has proposed, in the number of this Journal for November, 1868, that Teale's posterior flap should be relinquished, thus rendering the operation an amputation by single rectangular flap. This operation has been performed several times with success in Dublin. Vide Medical Press and Circular for 24th May, 1871.

[d] New York Medical Journal, Vol. vi., 1868, p. 485.

[e] Ibid., p. 512.

of inflammation have reached parts far distant from the articular surfaces, or where the soft parts covering the joint are too much involved in the destructive process which has been going on, then the idea of amputation at the joint should be at once abandoned."[a]

In doubtful cases the value of anæsthetics cannot be overrated. We are enabled, with their assistance, to explore the joint with impunity at the time of operation, and to decide upon the procedure most suitable when it is laid open and the exact condition of the bones ascertained, the delay being of little moment during the anæsthesia.

In the greater number of the cases given by Mr. Markoe, the amputation was by long anterior and short posterior flap. In some, in which there was no choice, a circular incision was made, and in others very irregular incisions. He, at the date of his paper,[b] seemed inclined to prefer the bilateral flap amputation,[c] an operation, in our opinion, warranted only in cases in which the condyles are not sawn, and which, according to him, shield, by their projection, the central antero-posterior cicatrix from the risk of pressure.

It cannot be too often impressed upon those who are about to perform the operation for the first time, to leave sufficient covering for the expanded extremity of the femur in the operation through the knee, and even through the condyles. " A miscalculation is easily made on this point, and it is one so vital that the greatest care should be exercised.[d] In the single flap, whether anterior or posterior, great length is necessarily given in order to cover the large expansion of the condyles. That this great length is a disadvantage, the numerous examples of sloughing afforded by the records most clearly show. . . . But, whatever operation be selected, let it never be forgotten, that more flap is necessary in this than in any other amputation; and that a prime requisite of success is that the end of the bone should be covered fully, easily, and without tension."[e]

Mr. Markoe is in accord with those who advocate the retention of the patella in amputation through the knee, and has not found it give any trouble when drawn upwards in front of the anterior surface of the femur.

He is opposed to the removal of the cartilage from the condyles when it can be preserved, and in no case has he seen anything unfavourable follow from leaving it.

[a] New York Medical Journal, Vol. vi., 1868, p. 515. [b] Ibid.
[c] Rossi and Dr. Stephen Smith. [d] Ibid., p. 516. [e] Ibid., p. 518.

A curious result has followed Mr. Markoe's analysis of the cases of knee or of condyloid amputations mentioned in two of his papers on the subject (seventy-three cases), cases that occurred in " American hospitals and private practice." Of these twenty-five died, " making the rate of mortality on the whole number thirty-four per cent."   .   .   .   Whereas, " in 987 instances of amputation of the thigh, collected from all sources, hospital and private practice, 435 died, a mortality of forty-four per cent., making a difference on the whole number of cases of ten per cent. in favour of the knee-joint amputation.   .   .   .   A more precise comparison would be instituted by taking the cases occurring in one institution, when the conditions might be supposed to be nearly identical. Thus taking the recorded cases of amputation of the thigh at the New York Hospital, from the year 1864, we have a total of sixty-one amputations and thirty-three deaths, or fifty-four per cent.   Of the knee-joint amputations we have thirty-nine operations and twenty-one deaths, a mortality again of fifty-four per cent., exactly the same as the mortality of amputations of the thigh."[b]

Surgeons differ as to the mode of dealing with the tendon of the rectus when the object is to procure ossific union between the patella and the cut section of the femur. The practice which I follow seems to me most calculated for favouring this desirable result.

The sections of the femur and patella having been made with the saw, I prefer dividing the tendon of the rectus muscle. For when the patella is applied to the cut end of the femur, it forms a right angle with the femur, thereby greatly increasing the leverage of the muscle, and consequent risk of displacement of the patella from its new position, unless the tendon is divided.

It may be said that the division of the tendon lessens the command over the stump. This is not apparent in the following case, the girl having, comparatively speaking, great power over it. The origins and insertion of the rectus muscle being more or less approximated by the shortening of the femur in the condyloid and supra-condyloid operations, the section of the tendon may, after all, be of little consequence as regards the function of the stump; whereas, if the tendon is not divided, the chance of displacement of the patella, while ossific union is in progress between it and the

[a] He has recently added to the number 91 cases, making altogether 164 cases, of which 53 died, giving a mortality of 35·31 per cent.

[b] Ibid , p. 508.

femur, is much increased. This process will be still further facilitated by cutting the bony surfaces perfectly flat and even. If the patella and femur are curved by the saw, as recommended in the condyloid operation, the area of their contact will be less than when they are cut with flat surfaces. The curving of the cut condyles has been advised, that the section may not have a sharp edge. But as the patella is the part destined for the direct sustentation, rather than incur the risk of lessening its surface of contact with the femur, I would round off with the frame saw the portion of femur projecting beyond its circumference.

The lion forceps I have found an efficacious instrument for firmly grasping the patella when in course of being sawn. By seizing the lateral edges of the bone in the two uppermost notches in each jaw of the forceps, held horizontal, it can be securely grasped, and yet allow of the removal of a sufficient amount of the articulating surface.

Amputation through the Condyles of the Femur, by Long Anterior and Short Posterior Flaps; Retention of the Patella and removal of its Cartilaginous Surface; Division of the Rectus Tendon; Tubular Presse-artère *applied to the Popliteal Artery; Torsion of the smaller Vessels; Antiseptic Treatment of the Stump; Recovery.*

Agnes M'K., aged twelve years, was admitted under my care into the Adelaide Hospital, on the 19th October, 1870.

In the preceding month of May she was attacked by severe pain at the inside of the left ankle, and shortly afterwards an abscess formed and opened a little above the internal malleolus, whence there was a constant discharge of matter. Other openings subsequently made their appearance between it and the knee, the highest one being close to that joint. The chief discharge escaped through the opening at the malleolus.

With the exception of poulticing she had no treatment until her admission to hospital. The left leg was then semiflexed upon the thigh, and the knee immobile from false anchylosis. Between the knee and the malleoli there were seven openings in the skin, communicating with cloacæ situated in the front and internal part of the tibia. The ankle-joint was much enlarged, and, when moved, was the seat of excruciating pain. Loose bone could be felt at the bottom of each of the three upper cloacæ. A probe could be passed directly into the ankle-joint through the lowest opening.

Percussion elicited slight dulness under the left clavicle, and was attributed by my colleague, Dr. Little, to alteration in the shape of the thorax and direction of the spine, caused by the peculiar position in which she had lain since the commencement of her illness. There was no evidence of renal disease. The pulse averaged 112.

Ordered an extra diet with wine, cod liver oil and syrup of iodide of iron.

The propriety of an immediate tentative operation for the removal of the loose bone was discussed by myself and colleagues, but, as she was much worn and debilitated, we concluded that it would be better, from the presence of the acute disease of the ankle-joint, to amputate rather than perform a partial operation.

Very slight improvement ensued upon the medicinal and dietetic treatment prescribed, and the ankle-joint pain was agonizing, although narcotics were freely given hypodermically and by the mouth.

Eventually I amputated at the knee, on 14th December, 1870, by long anterior and short posterior flaps. The anterior flap was formed of the skin of the front and sides of the knee and leg to a couple of inches below the tuberosity of the tibia. It was cut of a semilunar shape inferiorly, and was given sufficient width to cover the face of the stump. After the opening of the joint and division of the ligaments, the short posterior flap was made by cutting downwards and backwards. About an inch of the condyles was removed with the saw. The patella was next grasped with the lion forceps, and its articular surface sawn off with Butcher's saw, the blade of the saw having been previously fixed with its sides horizontal in the frame.

The rectus tendon was cut across just above the patella, for the reason I have given in the prefatory observations. My tubular *presse-artère*[a] was applied to the popliteal artery, and three or four smaller vessels were twisted.

As soon as the flaps were washed with a solution of carbolic acid, creasote, glycerine, and water, they were brought together and retained in position with twisted sutures. Finally the stump was covered with a thick layer of carbolic acid cream,[b] and she was

[a] For the description of this instrument *vide* the Medical Times and Gazette for April 24th, 1869, and November number of this Journal, 1869.

[b] The description of its composition will be found in the November number of this Journal, 1869.

given a hypnotic dose of solution of muriate of morphia. Extra diet; Liebig's essence of meat; wine, 6 oz.

The pulse rose in the evening to 120, and she was very restless. The morphia draught having been vomited, she had hypodermically $\frac{1}{6}$ gr. acetate of morphia, and $\frac{1}{120}$ gr. sulphate of atropia.

15th Dec.—Slept several hours after the hypodermic injection; pulse 145; tongue natural; appetite good; stump covered with another layer of carbolic acid cream.

To take three times daily two table-spoonfuls of a mixture composed of infusion and tincture of cinchona, with tincture of veratrum viride.

16th Dec.—Pulse 135. The hypodermic injection was repeated, and caused sound sleep. Stump syringed with a carbolic acid and creasote lotion, and then covered with a layer of carbolic acid cream.

17th Dec.—Pulse 132; tongue natural. She had a good night with the assistance of the hypodermic injection. Stump managed in the same way; ordered a purgative; chicken added to her diet.

18th Dec.—Pulse 120; tongue natural; slept well; no suppuration from the stump, which was managed in the same way. Wine reduced to 8 oz., and the cinchona mixture, with tincture of veratrum viride, was continued.

19th Dec.—Pulse 120; tongue natural. At noon I removed the *presse-artère* from the popliteal artery, being the 121st hour since its application. Not a drop of blood escaped. Some dilute sulphuric acid was added to the cinchona mixture, to check the purgative influence of the veratrum viride. Stump managed in same manner.

28th Dec.—Pulse 90. Same management of the stump, excepting that a couple of adhesive plaster straps were used to assist in maintaining the patella in contact with the femur.

5th Jan., 1871.—Stump nearly healed, and syringe discontinued. Up to this date no suppuration had taken place beneath the flaps, but matter came from the granulations uniting their margins, to which the carbolic dressing was incessantly applied, showing that here, at least, it was powerless to prevent suppuration. The patella felt firmly consolidated with the femur.

26th Jan.—Upon crutches daily since the 23rd January. The patella was immovable.

In April, 1871, I had a drawing (Fig. 5) taken of her by Mr. Burnside, who has accurately represented the shape of the stump.

I saw the girl in July, 1871. The stump was painless, bore

pressure well, and the patella was immovably fixed in its new posi-
tion.   The cicatrix was well above and behind the end of the bone.

Fig. 5.—Amputation through the Femoral Condyles, and by long anterior and short
posterior flap ; retention of the patella.   Agnes M‘K., aged 12 years.

It will be seen by the following description of the diseased tibia
that amputation was the most likely step to afford satisfactory
results in this case:—

The bone is diseased from two or three lines beneath the upper
epiphysary junction to the malleoli.   There is an imperfectly
formed bony case, the surface of which resembles sponge in
appearance, and is roughly tuberculated.   Excepting anteriorly and

internally it is deficient below. It is perforated by twenty-six openings, the greater number of which are situated along its anterior and internal surface. They are very irregular in shape, one being long and oval. These openings lead down to the old shaft, which has thrown off several loose, thin exfoliations, and one tolerably long and slender piece that might be called a sequestrum. The remainder and greater portion of the shaft from condyles to malleoli is porous, spongy, and rough, and is consolidated behind for its whole length with new bony deposit. It, also, is perforated or rather riddled below with openings, two of which directly communicated with the ankle-joint, the lower epiphysis having been detached during life. The largest of these openings allows the tip of the forefinger to enter it, and matter passed freely through both from the diseased bone to the joint.

The superior articular surfaces of the astragalus are completely deprived of cartilage, and when recent the bone itself was abnormally vascular.

Fracture of Thigh Bone, and its Treatment with the American Apparatus.

Of the numerous appliances that have been invented for the treatment of fractured thigh bone there are few more capable of producing good results, with little trouble to the surgeon, than the one known to European practitioners by the name of the "American" apparatus. When it is used the thigh need not be bandaged—a most important matter in oblique fracture with overlapping fragments, for many of the muscles of the thigh are so disposed that the constriction exercised by the bandage becomes itself a cause of shortening. Indeed, the muscles of the internal and posterior part of the thigh have been compared to cords extended between their osseous attachments. The roller necessarily presses these muscle cords towards the femur, and in this way, by acting antagonistic to the extending and counter-extending forces, tends to approximate their origins and insertions, and to draw the lower fragment of the femur towards the pelvis.

It is remarkable that Nélaton,[a] the countryman of Desault and

[a] It is curious that Nélaton should have overlooked the fact that Belloq, so far back as the year 1757, described and illustrated an apparatus for acting on the same principle in the treatment of oblique fracture of the femur as the more modern American apparatus.—Mémoires De L'Académie Royale De Chirurgie, 1757, Tome 111, p. 235. It is for its simplicity rather than for its novelty that the American apparatus is to be commended.

Boyer, whose splints have contributed to their fame, prefers the American apparatus to the splints of those celebrated men, as well as to every other apparatus known to him, for the treatment of oblique fracture of the shaft of the femur.

The mechanism for carrying out the American method of treating fracture of the shaft of the thigh bone varies a good deal, as will be seen in Hamilton's work on "Fractures and Dislocations." I have found that Dr. Hartshorne's[a] apparatus, with some modifications of my own, thoroughly counteracts the tendency to overlapping of the fragments. Its cost, moreover, is very trifling.

Dr. Hartshorne uses two splints, and dispenses with the perineal band, which I retain.

In addition to the transverse bar which carries the extending screw, his apparatus has a second bar that is connected with a foot-piece to which the foot is secured, whereas in Fig. 6 there is but one bar, that in which the extending screw plays. Dr. Chapin[b] uses two separate extending screws; but one screw with a double hook acts better. Fig. 6 is then constituted as follows :—

(1.) An external splint (pine wood) of sufficient length to extend from the axilla to some inches below the foot. Its width should be such that the holes for the ends of the perineal band may not be too near one another. The holes should also be only a short distance from the upper end of the splint that the anterior portion of the perineal band may not press the groin, and favour swelling of the limb. The splint is secured to the trunk by means of a couple of saddle girth bands, each provided with leather straps and buckles, and to the short splint by three leather straps with buckles, as well as by the transverse bar. The upper end of the splint should have a cushioned cap.

(2.) A short internal splint (pine wood) to extend from the perineum to the same distance below the foot as the external splint. Its upper end should likewise have a cushioned cap. Some of the American apparatuses have no inside splint, in which case the transverse bar should be immovably fixed to the outer splint. I use, however, the inner splint, because it prevents the long one from shifting its position, and thus assists in rendering the apparatus as firm and as steady as a box splint.

(3.) A birch-wood rectangular bar of the following dimensions :— Length, 12 inches; width from before backwards, 2 inches; vertical depth, $1\frac{1}{2}$ inches. From four to six holes are drilled in it at a

[a] Of Philadelphia, U.S.   [b] Of Massachusetts.

distance from one another a little more than the width of the
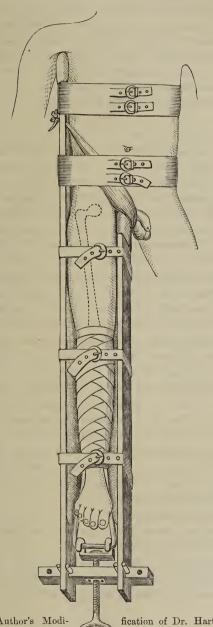
Fig. 6.—The Author's Modi-   fication of Dr. Hartshorne's apparatus
for Fracture of the Femur.

substance of the splints. They are for birch-wood pegs, which secure the parallelism of the lateral splints, and maintain them at the requisite distance from one another. Although not represented of this proportion in the illustration the bar should have the width from before backwards I have mentioned, to enable the male extending screw to turn steadily in it. This screw, including its ring handle, should be at least 14 inches long.

(4.) A female screw (iron) which is securely fixed in the transverse bar.

(5.) In the apparatus I used first there was but one swivel hook attached to the extending screw. Two hooks either soldered or riveted to a single plate, as seen in the figure, are preferable. Each of these hooks should be separated from one another by a space a little greater than the width of the ankle at the malleoli. The hooks form one piece with a narrow transverse iron plate, from the ends of which they rise, and which is secured to the extending screw by means of a swivel joint. It will be seen by the illustration that each side of the adhesive plaster loop diverges from the malleolus to its corresponding hook; therefore, when the extending screw is acting, the sides of the loop are prevented from unduly pressing the skin over the malleoli. On the other hand, should but one hook be used, the sides of the loop must converge to it, so that the greater the extension made with the screw, the greater the compression of the soft parts covering those processes, and the greater the risk of sloughing. To prevent this, wadding must be freely used under the strapping and a piece of wood broader than the sole of the foot secured between the sides of the loop. The double hook obviates the necessity of these precautions, with the exception of the use of wadding. This, however, is not to be used to an amount that would render the area of the adhesion of the strapping to the leg not sufficiently extensive to enable the strapping to resist the strain to which it is submitted by the action of the extending screw.

(6.) It is scarcely necessary to observe that a properly covered and stuffed perineal band, suitable pads, wadding, and scored splint form part of the apparatus.

Mode of applying the Apparatus.—Although the method of applying the adhesive plaster strapping and loop to the leg is described in Hamilton's,[a] and in many other works which treat of

[a] Ibid.

fractures, I will, nevertheless, explain it here for the convenience of the junior reader.

The limb having been sponged with vinegar diluted with water and dried, the hollows of the leg are filled with wadding. Five superimposed straps of soap plaster, having a width of two inches, and sufficient length to form an eight inch loop below the sole of the foot, are then applied to its sides. The ends of these straps should be placed at corresponding points a little above the knee at each side. The straps are secured to the leg with straps of soap plaster, according to the ordinary way of strapping.

The leg thus prepared, and the perineal band placed *in situ*, the saddle-girth straps are laid under the body, and the leather ones under the fractured limb, with the intervention of a pad long enough to extend from the buttock to the heel. The lateral splints are now applied, either wadding or pads being interposed between them and the soft parts. The transverse bar is at the same time secured by the pegs in the square openings made for it in the splints. The latter should pass a sufficient distance beyond the sole of the foot that the extending screw may be screwed home to its ring handle before it can act upon the loop. If this precaution be not taken, longer splints may subsequently be required, unless the plaster loop can be sufficiently shortened to enable the extending screw to act upon the limb. In hospital practice having to change the first applied splints for longer ones would be of little moment, but in private practice such evidence of miscalculation had better be avoided.

The ends of the perineal band when passed through the holes at the axillary end of the long splint are then tied. All the straps are next buckled.

When necessary, a scored splint and an underlying pad are to be secured on the front of the thigh by a couple of straps.

Unless the case be such as to require previous co-aptation of the fragments, this may be left to the influence of the extending screw, the hooks of which are passed into the plaster loop, the screw turned, and extension gradually effected.

A few turns of the screw morning and evening, for a couple of days, cause the patient but little annoyance, the muscles appearing

---

a I generally place the pad upon a splint of the ordinary thickness, and having a width proportioned to that of the limb and nearly the same length as the pad.

to offer less resistance when thus overcome than by a more rapid extension.

The following advantages may be claimed for this modified American apparatus :—

(1.) Facility of application.

(2.) Limb can be accurately measured without being disturbed.

(3.) Traction is made in the natural axis of the limb.

(4.) There being no bandages to become loose, it rarely requires re-adjustment after the first few days. It is, therefore, admirably suited for provincial practice, when, as too often happens, long distances have to be travelled, and visits at short intervals may be impossible.

(5.) Whenever the fragments are capable of being united without shortening, it is thoroughly efficient in producing this result. Speaking of the American apparatus, Nélaton says, that it has over Desault's, Boyer's, Bonnet's, Velpeau's, and Gariel's splints such a superiority, that he has cured without shortening all fractures of the body of the femur, for the treatment of which he has applied it, either in hospital or in town practice.

(6.) The expense of the apparatus illustrated in the figure is but trifling, the straps, transverse bar, and extending screw, costing only a few shillings.

The two following cases of oblique fracture of the shaft of the femur corroborate Nélaton in the high opinion he has formed of the American apparatus. They, moreover, exemplify the wonderful coincidence of accidents, similar in their nature, though unconnected with one another, that are met with at the same, or nearly the same, time in the same hospital, or in the practice of the same individual. The coincidence of unconnected, but similar, diseases I have exemplified in the November number of this Journal for 1869.[a]

Oblique Fracture of the Right Femur at its Middle Third.

James M., aged forty-seven years, was admitted under my care into the Adelaide Hospital, on the 18th December, 1870.

A few hours before being brought to hospital, he, while intoxicated, had been leaning against a baluster, lost his balance and fell to the ground, a distance of about six feet. He was stunned by the fall, became insensible, but soon recovered. Our resident pupil,

---

[a] Lessons from Surgical Practice.

Mr. Nesbit, visited Mills at 11 o'clock, p.m., and finding the shaft of the right femur fractured, had him removed to hospital.

I saw him soon afterwards. The right thigh was thickened and curved, the convexity of the curve being directed forwards and outwards, the most convex part of the curve corresponding to the middle third of the femur, where there was extreme tenderness to pressure. The foot was everted, and the limb shortened one inch and a half. Crepitus could be developed by imparting very slight motion to the member.

I placed the fractured limb in the apparatus. A piece of scored splint and pad were applied to the front of the thigh, and extension made with the extending screw, but the limb was not completely extended on that occasion.

Ordered a mixture composed of hydrate of chloral, bromide of potassium, syrup of ginger and water. Full diet with XX porter.

19th January.—The limb was in good position, but not being yet of its natural length, the extension was completed by a few turns of the screw without the supervention of pain.

His appetite being bad, he was given a gentian mixture, which, in a few days, was changed for one of quinine.

25th February, being the sixty-ninth day of the accident. The apparatus was removed, and the limb carefully bandaged from foot to pelvis. Œdema had not taken place while it was in the apparatus.

5th March.—No appreciable shortening of the limb could be detected by methodical measurement. He had been using soap liniment for the stiffness of the knee, the result of its prolonged immobility.

15th March.—He was allowed to move about on crutches for the first time since the accident, but vertigo soon compelled him to resume the sitting posture.

It is needless to give all the concluding notes of the case, and I will merely observe that after a few days walking with the crutches the vertigo ceased, and we were enabled to send him to the Stillorgan Convalescent Home. He returned in a month thoroughly restored to health, and with full power over the limb.

John M., aged sixty-five years, having been sent to me by Dr. Newland, of Kingstown, was admitted under my care into the Adelaide Hospital, on the 29th December, 1870.

He was driving a dray, on the 23rd December, when the horse

started and he was thrown to the ground upon his right side.   Dr. Newland recognized the nature of the injury, reduced the fracture, and applied Liston's splint.

The man being incapacitated from earning a livelihood, expressed a wish to be sent to hospital, and was accordingly brought to us on the 29th December. During the journey to town the bandages were loosened by the jolting of the cart, and the deformity was reproduced, so that when I saw him the fractured limb was one inch and a half shorter than the left one. The thigh was thickened, very convex forwards and outwards at the middle third, the fracture being situated in this part of the bone.

Having but one extending screw and bar, and these being in use with Mills, I reduced the fracture, and re-applied the Liston's splint until the Messrs. Booth[a] made another screw and bar for me.

30th December.—Having removed the Liston's splint, the limb was found to have become again shortened. I put it up in the American apparatus and gradually extended it. Scored splint and pad were applied to the front of the thigh.

31st December.—Limb gradually restored to its natural length by completion of the extension.

20th January, 1871.—The thigh straps were unbuckled, and the scored splint removed that the femur might be methodically measured. No appreciable shortening could be detected.

4th April.—The apparatus was removed, being the one hundred and second day since the accident, and a roller was applied to the limb. Methodical measurement could not detect any shortening. The apparatus would have been removed several days sooner, only that tenderness in the site of the fracture persisted to near that date.

8th April.—The limb continued of its natural length, but erythematous redness of the skin of the leg and lower part of thigh having occurred, it was dusted with starch powder.   He was given a mixture of infusion of quassia with iron.

4th May.—Had been moving about on crutches for some days, and was allowed to the Convalescent Home at Stillorgan.

Before he left hospital the limb was carefully measured, by Dr. Samuel Knaggs and Mr. Charles Ball, both of whom agreed that it was not appreciably shortened.

[a] 63, Stephen-street, Dublin.

Wathen's Cutting Forceps for Starch Bandages.

Those who have had frequent occasion to cut starch bandages with M. Seutin's[a] scissors can scarcely have failed to learn practically that it is by no means a satisfactory starch bandage cutter, the bandage being liable to get partially wedged between, instead of being cut by, the blades. This defect of the Seutin scissors has led many surgeons to substitute the knife and director for it; but these also are unsatisfactory, the knife generally becoming blunt before the division is completed. An awkward slip of the knife, too, may be the cause of some unforeseen accident. For instance, the inventor of the new cutter mentions that a fellow student of his lost an eye while the bandage was in course of being cut with a knife.

In 1869, Mr. J. Hancocke Wathen, of Fishguard, Pembrokeshire, first announced in the *Medical Times and Gazette*[b] the invention of the new pliers for cutting either starch bandages or glue splints; and in the number of the same journal for the following February[c] the instrument is illustrated and favourably noticed by the editor.
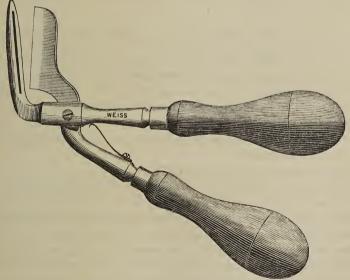
Fig. 7.—Wathen's Starch Bandage Cutting Forceps.

[a] Seutin, *Traité de la Méthode Amovo-inamovible.* Bruxelles, 1849.
[b] 14th August, 1869.   [c] 5th February, 1870.

Having often used Mr. Wathen's instrument and found it un-failing in its action, I am led to take advantage of the following case of fracture to bring it under the notice of those who may not be acquainted with this excellent cutter. (Fig. 7).

The illustration being large and accurate, a detailed description of the instrument is unnecessary. I may observe, however, that the lower blade has a longitudinal chink cut through it. This chink or slit is a little longer than the cutting blade, and merely of sufficient width to allow the blade to enter and move easily in it. When of those proportions the bandage cannot be forced into the chink by the uppermost blade. The latter is thin, being only a little more than a sixteenth of an inch thick at the back. There should be freedom from lateral motion where its shank passes through the stem of the lower directing blade.

If the instrument be constructed of proper material—material such as Messrs. Weiss, Coxeter, or Maw would employ—it will cut with unerring accuracy.[a]

Since I prepared this paper for the press, Mr. Wathen has informed me that Mr. Reeves, of the London Hospital, told him that the new cutter was " very generally used on the Continent during the late war."

Fracture of both Bones of the Leg; Union without Deformity.

Anne M., aged twenty-seven years, was admitted into the Adelaide Hospital on the 26th December, 1870.

On the evening of that intensely frosty day, when descending her sister's hall door steps, she slipped, was conscious of the right ankle snapping, and then fell.

Just as she came to the ground she experienced what she called " another terrible snap."

She was brought to hospital at $7\frac{1}{2}$ o'clock p.m.

Symptoms.—Abnormal curvature of the right leg, the concavity being on the inside, and most retiring about two inches above the internal malleolus; the sole of the foot looked more inwards than that of the opposite side; slight shortening of the limb at its inner aspect; total inability to move it; extreme tenderness when pressure was made two inches above the internal malleolus at the most retiring part of the curve; and great tenderness about four inches above the external malleolus; very severe pain in the

---

[a] It is kept in stock by the Messrs. Fannin, Grafton-street, Dublin.

ankle; coarse crepitus, best marked a little above the joint when the leg was flexed upon the thigh, its upper portion fixed, and lateral motion imparted to the lower fragments and foot.

Treatment.—The limb was restored to its normal shape without difficulty, and was "put up" in a modified box splint.

3rd Jan., 1871.—Limb in good position; blue and olive discolouration of the skin, being the 7th day of the fracture.

18th Jan.—Starch bandage applied.

28th Jan.—The starch bandage being dry, she was allowed to move about on crutches.

13th Feb.—Sudden effusion having taken place into the right knee, which had become exceedingly painful, the starch bandage was removed. It was cut "clean" in a few seconds, and without separation of its layers, with Wathen's cutting forceps.

I need not detail the concluding notes of the case, and will merely observe that local depletion, mercury, iodide of potassium, and counter-irritation were used before the joint regained its natural proportions, and its motions were restored.

When sufficiently recovered, she was sent to the Stillorgan Convalescent Home, where she remained a month, at the end of which the fracture was perfectly consolidated, and the movements of the knee were unimpaired.

There is much difference of opinion whether the starch bandage should be applied to a recently-fractured limb. For my part, notwithstanding the testimony to be found in some works in favour of its early application, I am not, for many reasons, an advocate for this. I like to be able to see the limb for some days after it has been broken, particularly in the case of females, who are not prone to forgive deformity, however trifling, and such might imperceptibly take place under the bandage.

The Pistol Splint and M. Nélaton's Splints for the Treatment of Fracture of the Lower End of the Radius.

Having frequently heard the "pistol splint" confounded with M. Nélaton's apparatus for the treatment of the fracture familiar to us in Ireland, under the name of "Colles' fracture," I am induced to reproduce here Nélaton's illustration of his apparatus, and the description of the way he manages the fracture.

To these points I have almost altogether confined myself, the object being to remove a very prevalent error into which our

students have been led by a much used illustrated surgical work,[a] in which the pistol splint is delineated and named Nélaton's splint. Indeed, in the last edition of Cooper's "Surgical Dictionary" likewise, it is stated that "instead of the ulnar splint, M. Nélaton has since used a dorsal splint curved at its lower end in the shape of the handle of a pistol."[b]

The following account of M. Nélaton's splints and mode of treating this fracture has been taken from the recent edition of his work. The evidence afforded by this passage is conclusive that down to the period of its publication[c] he had not adopted the pistol splint:—

"I apply," he states, "upon the dorsal surface of the carpus and upon the lower fragment of the radius two or three graduated compresses, placed transversely. Other graduated compresses are applied to the palmar surface of the forearm, parallel to the axis of the member; these compresses are folded at their lower end, so as to form a tolerably thick edge, which should be placed at about three-eighths of an inch (*centimètre*) above the transverse prominence formed by the upper fragment (Fig. 8). The compresses thus disposed, I apply two splints, which I secure in position with a roller. It is easy to understand that things being thus disposed, the dorsal splint is in contact with the forearm only above; it presses below upon the graduated compresses that cover the lower fragment, and immediately above these compresses there is a space. As to the palmar splint, it rests upon the graduated compresses that are over the interosseous space; but as these compresses do not descend so far as the hand, there also exists a space between this splint and the lower end of the forearm. The action of this apparatus is easy to understand: the two splints, being brought towards one another in consequence of the constriction caused by the roller, must tend to push the two fragments in contrary directions, by pressing them towards the empty space left between the surface of the member and the splints.

"When the displacement of the fragments is very pronounced, and the end of the ulna forms a very marked prominence at the internal side of the wrist, I add to the above described apparatus the ulnar splint of Dupuytren, which corrects the abduction of the hand, restores the styloid process to its natural level, and replaces the fractured surfaces in contact.

[a] Erichsen. Science and Art of Surgery.
[b] 8th Edition. London, 1861. P. 730.   [c] 1868.

" Dupuytren and Goyrand, imitated in this by other surgeons, sought, by inclining and slightly flexing the hand towards its ulnar edge, to produce a permanent extension upon the lower fragment of the radius, and to exercise pressure upon the dorsal surface of this fragment by means of the extensor tendons of the fingers that pass at this part.   But this extension, supposing it possible, appears to me useless ; indeed, if the apparatus is employed that we have advised, on remedying the antero-posterior displacement, the shortening disappears, unless there is reciprocal penetration: now, we have said that most often penetration exists only at the posterior part of the surface of the solution of continuity.   I have already treated a large number of fractures of the radius with the modified apparatus I have just described, of which I have also given the description in the first edition of this work, and I have almost always obtained consolidation exempt from deformity.   In several cases in which the fracture had been overlooked for one or two weeks, the apparatus, applied for twenty-four hours without previous reduction of the fragments, has always sufficed to restore the member to its normal shape: thus have I renounced, for almost all cases, reduction manœuvres; the application of the apparatus suffices for gradually replacing the fragments in their normal relations.   In a very small number of cases there remains, however, a slight prominence of the ulna.   This is seen in some exceptional cases, in which the lower end of the radius is broken into several fragments; then, it must be admitted, whatever may be the apparatus employed, it is impossible to obtain perfectly regular consolidation.
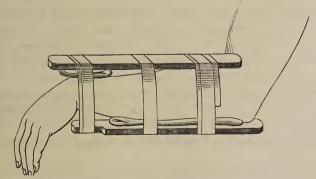
Fig. 8.—Nélaton's Splints for Fracture of the Lower End of the Radius.

" I must point out here some useful precautions.   When the

apparatus that I have described is used, (1.) It is necessary to take care that the posterior splint does not press upon the prominence, that the os magnum and the upper ends of the second and third metacarpal bones form at the dorsum of the carpus. Without this precaution, the patients often suffer very violent pain in the compressed point.

" (2.) It is useful to make in the palmar splint, that descends to the palm of the hand, a roundish hollow to receive the thenar eminence ; but this is not indispensable.

" (3.) Flexion and extension movements of the fingers should be executed early, in order that their free action may be rapidly restored.

" Is it necessary to say that if the displacement of the fragments is in a direction the opposite to that we have described, the same apparatus is still proper, but it should be applied in an inverse direction, so that a space shall exist between the dorsal splint and the lower fragment of the radius, &c. ?"[a]

It is quite certain then that Nélaton had not used the pistol splint down to the year 1868. Had he done so, he would scarcely have omitted allusion to it, not only, as I have already observed, in the edition from which I have quoted, but also in the first edition, published in the year 1844.[b]

Some writers attribute the pistol splint to Blandin.[c] He, however, was anticipated in its invention, as mentioned by Malgaigne, who, in his observations on the different modes of correcting abduction of the hand in "Colles' fracture," states that the attempt has been made to substitute for the iron splint (cubital) of Dupuytren wooden ones, " which should first cover the forearm in the ordinary way, and which at the wrist should bend sharply inward, not by their surfaces, *but by their edges*. M. Blandin (*Gazette des Hôpitaux*, Oct. 8, 1836,) proposed this kind of splint, which was, however, previously known (*Gazette Médicale*, April 9, 1836. P. 234)."[d]

[a] Élémens de Pathologie Chirurgicale. Par A. Nélaton, membre de l'Institut, Professeur de Clinique Chirurgicale a la Faculté de Médecine de Paris ; membre de l'Académie Impériale de Médecine, Chirurgien de l'Empereur, Deuxième édition. Tome Deuxième. Paris, 1868. P. 350.

[b] Elémens de Pathologie Chirurgicale. Par A. Nélaton. Paris, 1844. Tome premier. P. 739.

[c] Précis Iconographique de Bandages, Pansements et Appareils. Par M. le Docteur Goffres. Paris, 1858. P. 294.

[d] A Treatise on Fractures. By J. F. Malgaigne. Translated from the French, by John H. Packard, M.D. Philadelphia, 1859. P. 493.

I find that the article in the *Gazette Médicale* to which Malgaigne refers, and in which the description of the pistol splint originally appeared, is an anonymous *critique* on a paper by M. Goyrand (d'Aix), which was published in the *Journal Hebdomadaire de Médecine* the previous February. M. Jules Guérin was at that time the chief editor of the *Gazette Médicale*, but whether he was the author of the criticism, and thereby the inventor of the pistol splint, is not stated. At all events, the *critique* concludes thus:—

" M. Goyrand has employed his apparatus eleven times in two years, and always with complete success; and he thinks that it is everything that could be desired. However, if the fracture were either very oblique or comminuted, we doubt that permanent extension thus practised would be sufficient to assure to the radius its normal length; the fulcrum of the splint, below, appears to us very deficient; and the upper fulcrum is absolutely wanting, unless it is made to abut against the bend of the elbow, which would not be borne by patients. At the same time that this first condition would be wanting, we should add that direct extension of the hand is a forced position which always stretches the extensor muscles a little, some of which are already stretched by the flexion of the forearm upon the arm. Thus in a difficult case, such as we have just supposed, we think that more security and advantage would be derived from using Dupuytren's (cubital) splint, or better still, *two splints, anterior and posterior, bent inferiorly by their ulnar edge*."[a]

Such, as far as I have been able to ascertain, is the history of the pistol splint, which it is clear has neither been invented nor adopted by M. Nélaton, is not the invention of Blandin, but rather of an anonymous writer in the *Gazette Médicale*, possibly of Guérin himself.

Before concluding I may mention that I have used, with excellent results, Nélaton's apparatus on many occasions, but have combined Dupuytren's ulnar splint with it when necessitated by abduction of the hand.

The rapidity with which the fingers recover their movements after the discontinuance of the apparatus is not the least of its advantages.

[a] Gazette Médicale de Paris   Samedi, 9 Avril, 1836.   P. 234.   Not italicised in the original.

Art. XI.—*On Delirium Tremens.* By Thomas Laycock, M.D.,
&c. &c., Professor of the Practice of Medicine and of Clinical
Medicine, and Lecturer on Medical Psychology and Mental
Diseases in the University of Edinburgh.

In the Journal for February, 1870, Professor Cuming of the Queen's
College, Belfast, called attention to the important practical ques-
tion whether in cases of habitual drunkenness, and in commencing
delirium tremens, it was the more advisable to forbid the use of
intoxicating drinks altogether or to diminish gradually the amount
taken. His general views and conclusions are stated in an opening
sentence as follows:—" The great majority of recent writers regard
delirium tremens as a specific form of poisoning. Its occurrence at
a particular time is attributed to the fact that the poison has then
accumulated in the system to the amount necessary for the pro-
duction of the disease. According to this, which may be called the
toxæmic theory, delirium tremens is regarded as the cumulative
effect of alcohol taken habitually for a considerable period of time,
just as intoxication is the effect of a considerable quantity of alcohol
taken within a short time. This view, with only unimportant
modifications, is held, amongst others, by Drs. Peddie, Laycock,
Gairdner, Hughes Bennett, Aitken, Wilks, and Anstie, all of
whom reject the notion that the withdrawal of alcohol has anything
to do with the production of the disease; and although various
authors have urged opinions adverse to this view, it must be ad-
mitted that their efforts have met with little success.

" Having had many opportunities of studying the disease, both in
hospital and in private practice, I have become convinced that this
theory is inconsistent with observation, and that there exists, in a
large number of cases, so distinct a connexion between the with-
drawal of alcohol and the supervention of delirium, that I have been
irresistibly led to the conclusion that these two occurrences stand
to each other in the relation of cause and effect. As it is by our
notions of the pathology of the disease that our treatment must be
ultimately regulated, I venture to offer the following remarks,
which will be found to possess a direct bearing on this subject, and
which may, I hope, lead to a reconsideration of it."

Upon reading the paper I felt that Dr. Cuming might justly
expect the reconsideration he invites.

With a view, however, to greater precision in discussing the

questions involved, I must state that I wholly repudiate the toxemic theory which Dr. Cuming attributes to me, amongst others. I have already done this in a correspondence I had with Dr. George Johnson, in the *Lancet*, for June, 1866. According to my view alcohol is only one of several noxious ingredients in intoxicating drinks; the whole class of bitters taken habitually and in large quantities are, in my judgment, as injurious to the brain as alcohol. I hold, therefore, that to speak of alcohol as the sole or even in many cases the chief injurious agent is unscientific and an error. The baleful influence of the " sirop d'absinthe " owes something of its peculiar noxiousness to the bitter it contains. Nor do I at all hold that delirium tremens is a cumulative effect of either alcoholic or other intoxicants, in the same sense as intoxication is the effect of a sufficient quantity taken in a short time. The connexion is certainly much more complex than here stated, for comparatively very few habitual drunkards have attacks of delirium tremens.

After re-consideration, then, and further careful observation, I adhere to the conclusion—not as stated absolutely by Dr. Cuming, but as in accordance with fact—that the withdrawal of alcohol, or, more accurately, of the usual stimulants, has comparatively little influence as a cause of delirium tremens; not so much influence as the want of food.

In the Royal Infirmary of Edinburgh there are two wards commonly called the " D. T. Wards," into which all kinds of urgent brain-cases are received; they are in charge of the clinical and ordinary physicians in quarterly rotation. During the two last summers of 1870, and 1871, they have been under my charge, and I have watched all the methystic cases admitted, numbering about 60, with a special consideration of Dr. Cuming's views, but with the result already stated; indeed so entirely in opposition to them, I may add, that I must trespass a little upon your space by re-capitulating the results of Dr. Cuming's observations, before stating my own.

After describing the career of an habitual drunkard, and how it may be checked in three ways—viz.: by restraint at home, or at an hospital; or his stomach may reject the drink—Dr. C. observes "that very frequently men of magnificent organization, when stopped in one or other of these ways, get well after a few days of horrible discomfort, without passing through anything approaching to delirium; but in others a stage of twelve hours or so intervenes, in

which the patient will take nourishment, although unwillingly; will even sleep a little; and by this the physician is often led into the fallacious expectation that his patient is to escape an attack." Dr. C. proceeds to add:—" However, at a period varying from thirty-six to sixty hours, and, probably, in the majority of instances, under forty-eight hours, he begins to hear noises, or to see some imaginary object, and in a short time the attack becomes developed. Now I am aware that many excellent observers, among whom I may specially notice Dr. Peddie, of Edinburgh, who has contributed an excellent paper on this disease, state that delirium tremens usually comes on while the patient continues to drink. I am able to state, as the result of a not inconsiderable, although, of course, limited experience, that in no single instance in which I had an opportunity of personally observing the patient, did this occur. My experience may be exceptional, but it is positive on this point. Nay, more, I have witnessed the supervention of the attack at a period so uniform and regular, dating from the discontinuance of the alcohol, that I have been inevitably led to the conclusion, a conclusion quite opposed to what I was prepared to expect, that there exists a relation of cause and effect between these two occurrences. Given an individual who has once had delirium tremens; given, also, a certain period of indulgence, the length of which will, of course, vary greatly with the individual, and with the amount of alcohol, we may predict the supervention of delirium tremens within two days from the time when he ceases to drink with fully as much precision as we can foretel the period of maturation in a case of variola, or the crisis in a case of typhus fever.

" I do not say that a continuance of his indulgence will indefinitely protect a patient, nor do I say that to encourage such a continuance is at all permissible, but I do say that it is quite within the power of the physician to determine the period when the attack shall supervene by depriving the patient of his drink."

" It is necessary to observe that the discontinuance of the alcohol may be either absolute or relative. I have several times witnessed the effects of complete abstinence. I have reason to believe that similar results follow from relative abstinence. For instance, I do not think that with respect to a man who had been drinking twenty glasses of whiskey daily for a fortnight it would make any practical difference as regards the supervention of delirium tremens if he were allowed one or two glasses of whiskey in divided doses during the twenty-four hours."

Dr. Cuming intensifies and qualifies his conclusions as follows:—
" I have myself seen no one case in which delirium tremens set
in, in which the patient was alcoholized, and several medical friends
of large experience in the disease have confirmed my observation on
this point by their own.

" I would by no means be understood to assert that delirium
tremens may not come on while the man continues to drink. I merely
state that I have not myself witnessed any such case. Several are
recorded by observers of such eminence that I cannot hesitate to
accept this as a form in which the disease may manifest itself. It
is remarkable, however, that the experience of some observers
should be so completely opposed to mine, Dr. Laycock, for example,
having found that in twenty-one out of twenty-two cases the
patient was alcoholized on admission into hospital."

Dr. Cuming thinks the discrepancies between the results of his
observations and those of numerous observers besides myself can be
explained by assuming the imperfection of their inquiries as com-
pared with his own. He remarks:—" I am anxious not to be under-
stood as throwing any doubt on the published cases which point in a
different direction from mine, but I may be allowed to say that the
evidence in many of them is very incomplete, and that hospital
physicians who rarely see cases of this kind before the delirium has
set in, are necessarily obliged to depend for the histories of their
cases on those who accompany the patient, and that consequently
these histories lose the most important guarantee of their accuracy—
namely, the direct personal observation of those who record them.
The friends of a patient naturally attach greater importance to the
weeks during which he has continued to drink than to the few days
during which he has drunk little." Upon this point I must
seriously differ from Dr. Cuming. In the cases I have observed
great care was always taken to ascertain the facts, and with
sufficient success; whilst in the instances of drunkards received
into prisons and other places of detention, where total abstinence is
enforced at once, the evidence must be held to be, at least, as
unquestionable as his own.

I have before me an abstract of twenty-four of the methystic
cases received into the Royal Infirmary, to be under my care,
during the past summer, made by my clinical resident physician,
Mr. Alexander Macdougal, M.B.[a] They can be classed under

---

[a] Since these lines were sent to press, I have to lament the premature death of my
young friend, from diphtheria, caught in the Infirmary, while in charge of surgical wards.

three heads, viz. : as being drunk on admission ; as in the " horrors," or first stage of the delirium ; and as in actual delirium tremens. In every one of these 24 cases there was a withdrawal of alcoholic stimulants, in the presence of my clinical class, to the extent which Dr. Cuming has found to induce the disease ; but none of the drunken cases became horrored or delirious ; none of those with " the horrors" advanced to the next stage ; and all in the delirious condition rapidly recovered.

I subjoin only one illustrative case of each class, as it would be too great a demand on your valuable space to give the whole abstract :—

Case I.—" *Ebrietas*."—Catherine R., aged thirty-two, has been twice in the ward before. Brought in drunk ; had been drinking for seven days, and eating very little ; after a drunken sleep complained of frontal headache, and had tremors of tongue and extremities ; slight cough, no expectoration, no physical signs ; Pulse 84, soft. Tongue furred ; no appetite ; thirst ; slight pain on pressure in epigastrium ; vomited food once ; bowels costive.

Treatment.—Milk and beef-tea ; then steak diet. Recovery in six days.

Here is the case of an habitual drunkard of the worst kind, who has already been twice under treatment before, yet is made sober without a bad symptom, without any stimulant whatever.

Case II.—"*Horrors*."—James T., aged thirty-six, an auctioneer. Habitual drunkard. Treated in the ward once before. Has been drinking whiskey for three weeks. Has taken little food, and for the last three days has vomited everything. Slept for an hour or two when " dead " drunk, but not otherwise. Dreams of falling over precipices ; headache at vertex, where also he has a feeling of compression ; sleepless ; tremor of tongue and limbs ; no illusion of sight or of hearing ; quite coherent. Slight morning cough ; reduplication of first cardiac sound ; pulse 72, of good strength ; tongue moist ; slight white fur on dorsum ; no appetite ; great thirst.

Treatment.—Milk and beef-tea, which were retained from the first ; afterwards steak diet ; to have m. xv. of aqua pura at bed-time as a *placebo;* also a basin of warm beef-tea with a glass of sherry in it. Slept well. Recovery in three days.

In this case it is probable that the whiskey taken previously to

admission was vomited. He was not at all of a " magnificent organization," but quite the contrary; had no stimulants curatively after admission, yet he quickly recovered from the stage of " horrors."

CASE III.—" *Delirium tremens.*"—William W., aged twenty-seven. Had not been in the ward before. Has been drinking whiskey for 15 days, up to admission; during last four days has taken hardly any food, and has had no sleep. On admission is talking incoherently, and very restless, getting out of bed every minute, till he was tied in bed, when he continued throwing his limbs about as much as possible for ten hours. He then slept. On awakening, had headache, tremor, and great exhaustion, with entire loss of appetite; vomiting and thirst; bowels costive.

Treatment.—Head shaved and ice-cold cloths applied; milk and beef-tea, with six ounces of sherry; in 24 hours afterwards he took ʒij. of infusion of digitalis and ʒvj. infusion of quassia thrice daily. Recovery in eleven days.

In a similar case of a blacksmith, aged thirty-five, who had been drinking for several weeks, and was brought to the ward, by the police, in such an excited state that it required five men to hold him, immediate calm followed upon the hypodermic injection of m. xxx. of a solution of bimeconate of morphia, of gr. ix. to f. ʒi.

These are examples of numerous similar results of treatment of drunkenness and its consequences, witnessed in not fewer than 200 cases, in which the withdrawal of alcoholic and other intoxicating drinks was insisted on. They not only point in a different direction to Dr. Cuming's doctrine, but are actually antagonistic as facts of experience, independently of all theory. Dr. Cuming will notice, doubtless, that in one of the cases ʒvj. of sherry per diem was allowed, but I may say that this belonged to a class of quite exceptional cases, so that it is not a strictly accurate statement of my plan to say, as Dr. Cuming affirms:— " The instinct of most practical men has led them, in spite of theoretical considerations, to the adoption of a line of treatment of which a moderate amount of alcohol forms a part—an instance not uncommon in medicine, of our practice being in advance of our theory. Dr. Laycock, for example, would allow a moderate amount of wine—a rule quite judicious, although hardly reconcilable with his theory of the disease."

I venture to add that Dr. Cuming's dialectical hit as to my theory being hardly reconcilable with my practice, is more ingenious than ingenuous. I have already repudiated the toxemic theory, but I must add that so small an amount of wine or brandy as I prescribe could not, according to Dr. Cuming's experience, have any sensible effect. Relative abstinence, he affirms, is as potent to induce the delirium as absolute abstinence.

According to my experience, there are special conditions of the heart and nervous system, in cases of delirium tremens, like those in other diseases which indicate alcoholic drinks medicinally. I subjoin, in illustration of this important point, an extract and a case from my " *Practical Notes*," published in the *Edinburgh Medical Journal* for November, 1862 :—

" *Alcoholic Stimulants.*—These are available in all asthænic forms of delirium, however caused. They have been hitherto administered in the methystic form, chiefly on the theory that the sudden withholding of the habitual stimulant is the exciting cause of the delirium. The depression of the nervous system may be partly due to the want of the accustomed stimulus; but all experience shows that it is still more commonly due to morbid causes of a more general character, such as induce a feverish cold, a fit of indigestion, of the gout, or the like. Without such concauses, abstinence from habitual stimulants will not excite delirium tremens. The habitual drunkard distinguishes the depression which commonly succeeds to stimulation as ' the blues;' ' the horrors ' is a different thing, and occurs when any indisposition induces loss of appetite, languor, disturbed sleep, and other symptoms of the class. It is the depression thus induced by this same morbific cause which constitutes the first stage or simplest form of delirium tremens. The intensity, therefore, is partly, at least, determined by the kind of indisposition or acute affection; and it is this we have to remedy. The indications, therefore, for the administration of alcoholic or habitual stimulants must be drawn from the then condition of the patient, just as in other diseases in which remedies of this class are useful. When food has not been taken for several days, and the hallucinations are of a frightful or distressing kind, and especially when the pulse is very quick and feeble, the first sound of the heart heard indistinctly, the tongue coated, œdematous, and flat, or indented at the edges, wine and brandy may be administered medicinally with advantage. Sometimes this state of prostration is due to the combined influence

of drinks and opium or its salts, or to opium alone.   In either case, alcoholic stimuli may be given.   The following is an example:—

*Delirium Tremens and Poisoning with Laudanum and Brandy.
Delirium Suicidal.   Tremors excessive: Fourth or fifth Attack.
Duration about Eleven Days.*

J. S., a broker, aged 52, admitted into the Royal Infirmary on 29th May, 1862.   It is his fourth or fifth attack of delirium tremens. He was intoxicated and under the influence of opium when admitted, his friends having given him brandy and laudanum that he might be quietly conveyed to the Infirmary.   Has been drinking brandy, porter, and ale for the last ten days, but no whiskey, as he had made a promise to that effect when in the Infirmary on a previous occasion. Sometimes he does not take drink for two years.   His appetite is generally bad, and his bowels constipated; complexion dingy; countenance very anxious.   Intoxication having passed off, he feels extreme remorse for his conduct.   Nights wholly sleepless.   His tremors are so violent as to shake the bed.   Complains of a dull aching pain in the head and ringing in the ears.   Tongue flat and moist, but coated; pupils contracted; conjunctivæ icteric; has hallucinations, when he shuts his eyes, of bears, and dogs, and animals he cannot describe, which walk around his bed as if to attack him; also giants, who make faces at him and tease him.

Treatment.—A purgative enema; strong beef-tea, with or without small quantities of brandy, according to the state of pulse.   On 2nd June ordered nitrate of silver and muriate of morphia, as the stomach was exceedingly irritable.   In the evening the pulse was 130 and weak, and prostration great.   Ordered from four to six ounces of brandy, to be taken in small doses over twenty-four hours, either in water or strong beef-tea, as the stomach will bear.

Progress of the Case.—Little or no sleep for several days; the mental affection more and more developed.   31st May —Fancied he saw the devil and a large black dog in the water-closet, and a sow in the ward, and that vermin were crawling over him.   1st June.— Same hallucinations; but also sees a number of people in the ward mocking him.   2nd June.—Tried, when in the water-closet, to commit suicide by strangulation, thinking he heard his wife say, " Go and hang thyself."   Believes he has attended his own funeral, and called out to imaginary persons at the window that they would find his body at the Infirmary.   Complains that cockroaches and flies are going in and out of his ears.   3rd June.—Last night

endeavoured to throw himself out of bed. Fancies the lower end of the bed rises so that he rests on his head (vertigo), and to obviate the result, he advances his body forward. Affirms that his hands are charged with electric fluid, which dissolves anything put into them, and had in fact dissolved an old gentleman's watch; that children are attached to the top of the room, and that if he moves his eyes from them they will fall. Hears brass bands playing very beautiful music. 4th June.—Is constantly talking in a low tone about his business. Tremulousness still very great, and nights sleepless; often attempts to get out of bed. During the last three days has had four ounces of brandy in the twenty-four hours, in small and frequent doses, and beef-tea freely.

5th June.—Slept for eight hours during the day, and the whole of the following night. 6th June.—Free from all hallucinations. 9th June.—Quite well, and dismissed cured. Duration of treatment to sleep coming on, nine days.

This case is an example of the most severe and troublesome type of the delirium, and would, I think, have terminated fatally under the old method of laudanum and whiskey.

In truth, Dr. Cuming propounds a theory which includes several others, but which I need not discuss, since they all turn upon the time-honoured dogma—that, to cure a drunkard of his discomforts and his horrors when the drink is out of him, you must administer "a hair of the dog that has bitten him," and let him down gently. Now I do not deny the propriety of relieving the miseries of the drunkard; but I think that may be done by other drugs than "alcohol," and even without drugs at all. The good results of this method have been signally manifested in the Edinburgh Royal Infirmary. Formerly, the old procedure of giving stimulants with or without opium, was the regular routine. I have the best evidence—that of eye-witnesses—that this was followed in the "D. T. Wards" during the three years from the 1st October, 1845, to 30th September, 1848, when amongst 144 admissions there were 51 deaths, or at the rate of 35 per cent.; while, during a period of eleven years, ending 30th September, 1850, there were 481 admissions and 125 deaths, or 26.0 per cent. In October, 1858, I published, in the *Edinburgh Medical Journal*, my first paper, "*Clinical Illustrations of the Pathology and Treatment of Delirium Tremens;*" the withdrawal method then came into general practice, and with the following results, as kindly abstracted for me, by Mr. Macdougall, the treasurer:—

Cases *returned as " Delirium Tremens," in the Royal Infirmary, Edinburgh, for Ten Years, 1859 to 1869.*

Year	No. of Cases	Died	Per Cent. of Deaths
1859–60	74	1	1·37
1860–61	54	2	3·6
1861–62	58	1	1·72
1862–63	69	3	4·35
1863–64	69	1	1·45
1864–65	73	7	9·6
1865–66	92	2	2·17
1866–67	86	5	5·81
1867–68	49	4	8·36
1868–69	44	–	0·0
Total	668	26	3·89

Two of these years—1864–65 and 1867–68—present, for Edinburgh, an exceptionally high mortality; but low, when compared with the previous mortality and with other statistical returns. In St. George's Hospital, London, during the years 1850–55 the mortality was 14·6 per cent. In his report of the health of the army in 1853, Colonel Pollock returns the mortality from *delirium tremens* at 17·6 per cent. for the infantry, and 13·0 per cent. for the cavalry. The treatment was probably on the theory which Dr. Cuming advocates, and at one time so generally acted on, viz., that the disorder of the brain is commonly induced by the withdrawal, and may, therefore, be prevented or cured by the administration of intoxicating drinks.

ART. XII.— *Case of Ovarian Tumour—Ovariotomy—Recovery. With Remarks upon a New Method for Securing the Vessels of the Pedicle.* By Dr. P. J. Hayes, one of the Surgeons of the Mater Misericordiæ Hospital.

The history of a case in which the operation of Ovariotomy was performed with success, will I trust prove interesting to the readers of the *Dublin Quarterly Journal*, and I avail myself of this opportunity to publish my ideas respecting a subperitoneal method of securing the chief vessels of the pedicle, or peduncle; a proceeding which I believe will be found advantageous in many

instances, and which, so far as I know, has not hitherto been suggested by ovariotomists.

I have to thank Messrs. Curran and Wilson,[a] lately resident pupils at the Mater Misericordiæ Hospital, for notes which afforded me considerable aid in preparing the following report.

Anne D., aged thirty-two years, married, and mother of two children, admitted to the Mater Misericordiæ Hospital early in July, 1870.

The history she gave was, that she lived at Swords, in the Co. Dublin, was married about eleven years back, had two children, the second being between eight and nine years of age; her husband left her eight years ago, and she never heard of him since. She enjoyed very good health until about sixteen months before her admission, when she felt a dull kind of pain in the left iliac region, attended with a distressing dragging sensation in the back, and soon she noticed a fulness in the left iliac region and left side of the hypogastrium. Gradually the swelling increased, extending to the right as well as upwards and forwards, but the pain abated, and ultimately gave place to a sense of weight and great discomfort when the abdomen was not well supported; in the recumbent position she generally felt very easy, the catamenia appeared regularly, and, save that the bowels were rather inactive, her general health seemed to have been but little disturbed.

Examination of the abdomen displayed a great fulness, especially marked on the left side, but extending upwards and to the right; a slight touch was sufficient to cause a most distinct wave of fluctuation to be transmitted in every direction; the abdomen was dull on percussion, save in the right ilio-lumbar and left lumbar regions where resonance existed. Lineæ albicantes were very apparent, superficial veins but slightly enlarged, whilst the tumour felt smooth, and, on pressure, resistant.

The diagnosis formed was, that a tumour, ovarian and monocystic, existed upon the left side; that as the abdominal wall could be moved over the surface of this tumour, and the recti muscles rose in relief when the patient attempted to exchange the recumbent for the sitting posture, it was likely no anterior adhesions existed, and, as the previous history gave no ground for the supposition that peritonitis might have occurred, it was also likely that posterior adhesions were either absent, or very unimportant. My colleagues

[a] Since the above was printed, death has deprived me of those two esteemed young friends.—P. J. H.

carefully examined the patient, and arrived at like conclusions At my request, Drs. M'Clintock and J. A. Byrne saw the woman, and satisfied themselves that the condition of the uterus was normal, and that my diagnosis was correct as to the nature of the tumour.

The all-important question of treatment was now fully explained to the poor woman, and, without hesitation, she pronounced her selection to be that operation which would afford a prospect, however slight, of leading to rapid and complete recovery. The weather being extremely hot, and unfavourable for suppurating wounds, I strongly advised her to spend a few months in the country, and with return of cool weather to come back for operation. Accordingly she left hospital and did not again appear until March 27th, 1871. She explained that this delay was due to the illness and death of her second child. Her condition was altered only in the following respects :—The tumour was larger, as she measured forty-one inches in circumference at the umbilicus; the menses now returned every three weeks; she was losing flesh, though the appetite remained very good. The feet became slightly œdematous during the past two months, and occasionally there was a little difficulty in micturition. At times she felt bilious headache, and nausea, and complained of palpitation after exertion. The pulse was 84. No cough or undue dyspnœa present, and her aspect was that of a person in excellent health. Drs. M'Clintock and Kidd again saw the patient, and agreed that her state was as suitable as could be for ovariotomy.

I now directed that she should take m. x. doses of tincture of the perchloride of iron and of spirit of chloroform, three times daily, whilst in other respects she received every care and attention, so that nothing might be wanting to enable her to bear the operation, and combat its depressing consequences ; her mental condition was as favourable as could be desired, for her spirits were calm, even, and hopeful.

On the 14th of April the menstrual discharge occurred and continued until the 17th, so, bearing in mind that of late it appeared every third week, I selected Friday, the 21st, as the time for operation. On Wednesday evening a dose of castor oil was given, and the bowels acted well even on Friday morning. A fine, airy, separate ward was specially prepared, and no circumstance overlooked which might add to the well-being or comfort of the patient. At half-past ten o'clock on Friday morning, the catheter having been used, the patient was clothed in a flannel suit, made for the occasion, and covered with a fenestrated waterproof apron, which permitted

sufficient exposure of the abdominal surface; the operation table was arranged in the ward, and the bed heated to receive the poor woman after the operation. In accordance with my wish, no pupils, save the residents, were admitted, but my colleagues and some surgical friends rendered the number of spectators about twenty-five. Chloroform was administered by my friend and colleague Dr. Curran. Dr. Cruise arranged to sponge the wound, make pressure on the abdominal parieties, and prevent intestinal protrusion, whilst Dr. Tyrrell gave me the various instruments as they were required, and subsequently aided me in withdrawing the tumour.

I began the operation by making an incision about four inches long, commencing nearly two inches below the umbilicus. On reaching the aponeurosis of the " external oblique," I found my incision lay over the right rectus muscle, but without difficulty I was able to expose the linea alba (which was drawn to the left of the middle line). I next carefully divided tendon and fascia until the peritoneum was exposed. I could cause the serous membrane to glide over the anterior surface of the tumour, and consequently felt confident that no adhesions here existed, so, as no vessels required to be secured, I readily divided the peritoneum to the full extent of the cutaneous wound, and, at the suggestion of Dr. Kidd, increased by an inch the length of the entire opening. I next passed my finger over the forepart of the tumour, and ascertained positively the absence of anterior adhesion, so without delay I tapped the bulging cyst, with Spencer Well's trocar; the liquid, which was thin, transparent, and straw coloured, was conducted through india-rubber tubing into large tin vessels placed under the table. The quantity drawn off amounted to twenty-seven pints.

As the cyst became flaccid, I was able to draw it gently from the abdominal cavity, and in so doing I found there were three points where slight connexion existed between it and the great omentum; those bands were partly broken through by the finger, and partly divided with scissors; slight bleeding occurred when the adhesions were cut, and, at the suggestion of my colleague, Dr. Cruise, I applied a pointed piece of nitrate of silver to the orifices of the small vessels. This at once stopped the oozing, and the pedicle was soon freely exposed—two or three very small thin walled cysts adhered to the neck of the tumour, and were removed with it. As the pedicle was rather short and thick, it seemed at first doubtful whether the clamp ought to be applied. Many of the surgeons present advised me to employ a ligature, cut the ends off short, and

return the pedicle so secured; but I assured myself that the clamp could be used without causing undue traction upon the uterus, even should considerable distention of the abdomen take place.   As I was not singular in holding this view, I applied the clamp compressing the pedicle with all my strength, whilst my friend, Dr. Stokes, jun., turned the fixing screw home; I then cut through the ovary which was just beyond the clamp, lightly sponged the edges of the wound, and brought them together by means of three or four deep and as many superficial sutures.   The material used was Arnold's plaited silk, and the deep sutures included at least two-thirds of an inch of the peritoneal surface at either lip of the wound. Thick soft pads of cotton wadding were laid on each side, and pledgets of folded lint introduced between the clamp and the integument. A broad quilted belt was fastened round the abdomen over all, and the patient then gently lifted on to her bed.

She bore the operation well, and there was no sickness of stomach, but as she complained of some pain, I ordered the immediate administration of m. xxv. of Battley's solution.   A few hours later I found her still suffering pain, and in consequence prescribed half grain doses of opium in pill, to be repeated every third hour until the pain should cease; she took in all three pills. The stomach became disturbed towards night, but the administration of drop doses of creasote in iced brandy and water quickly removed the sick feeling.   An enema of strong beef-tea with a little brandy was given twice during the first twenty-four hours, after which the patient began to take milk and soda water, a combination that seemed to agree well with her.   Linseed-meal poultices were applied to the abdomen with soothing effect, and no marked distress was complained of subsequently.

I append a table of the pulse rate and temperature during the critical period succeeding the operation, from which may be understood how slight was the demand for medicinal aid, as, in fact, no drug was prescribed excepting drop doses of tincture of aconite (sixteen times repeated) on two occasions, when the pulse seemed to indicate the advent of inflammatory action, and three castor oil draughts during the second and third weeks.

Nutritive enemata were regularly administered three or four times daily, until the fourth day, a little iced brandy and water given occasionally by the mouth; milk, or milk and soda water, being also taken.   On the fifth day an enema of chicken broth and oil was ordered, with the object of causing an alvine evacuation;

and at three different periods, when there was evidence of intestinal flatulence, a large, soft catheter, passed high into the rectum, permitted the gas to escape, with great relief to the patient.

	Pulse rate		Temperature		Action of Skin
	Morning	Evening	Morning	Evening	
April 21 Day of operation	90	94	—	—	
„ 22	96	100	—	—	Very slight.
„ 23	104	100	101·8	100·	Slight but increasing perspiration.
„ 24	128	120	101·	101·4	
„ 25	112	108	101·4	101·2	Skin acting freely.
„ 26	108	104	101·	101·4	
„ 27	104	100	101·6	101·	
„ 28	96	96	100·2	101·6	
„ 29	94	96	100·	100·	
„ 30	92	94	99·6	100·	
May 1	90	92	99·5	99·8	
„ 2	86	86	99·2	99·	
„ 3	86	84	99·2	99·	
„ 4	84	84	—	—	

The sutures were withdrawn on the third and fourth days after the operation, and on the tenth day I removed the clamp without causing the slightest disturbance. The woman's progress to recovery was throughout all that could be desired. On the 13th of May the menstrual period arrived, and the patient was alarmed at the muco-hæmorrhagic character of the discharge, which continued but for three days. She left hospital at the beginning of June, feeling "as well as ever."

I was surprised to learn that, on the 23rd of June, my patient

returned to hospital. I found her looking fat, strong, and in excellent spirits, but she had been a little uneasy, as during her drive to Swords she felt cold, and subsequently suffered from sore throat; also a few granulations appeared at the lower end of the cicatrix (the site of the pedicle); and on the 17th June, when the menses returned, those granulations bled like the surface of a menstrual ulcer. Nitrate of silver was now applied; cicatrization steadily progressed; and, at the succeeding catamenial discharge, but a few drops of blood oozed from a yet unhealed patch. The poor woman was engaged by the Sisters of Mercy to work in the house, and accidentally she became exposed to small-pox contagion; the disease attacked her in a mild form, and soon she was able to resume her duties, her strength being completely restored.

I desire here to introduce to the notice of the profession a method I shall call " sub-peritoneal," for securing the vessels of the pedicle after the removal of an ovarian tumour. In my opinion it will prove useful, especially where the pedicle is short. The proceeding closely resembles that known as the subcutaneous ligature of Nævus, and consists in firstly compressing the pedicle between the blades of a clamp or long forceps, then passing a needle armed with a stout catgut ligature beneath a good thickness of the serous surface of the pedicle, but superficial to the principal vessels; the needle being withdrawn at the side opposite to the point of entrance, is again passed into the aperture of exit, and pushed between the vessels and peritoneal covering, on the side of the vessels opposite its first passage, until it can be withdrawn through the opening made by its first entrance; then the ends of the catgut ligature are to be strongly tied, and cut off short, so as to prevent the possibility of hæmorrhage from the included vessels, yet, owing to the bulk of unligatured substance superficial to the catgut, there will be no sloughing of the end of the pedicle, its vitality can be maintained, and even adhesions will probably connect it with some adjacent portion of the peritoneal surface, whilst in time the catgut, enclosed by living tissue, may become absorbed. Although bleeding from the chief vessels can be prevented in the manner described, yet it is quite possible that oozing may take place from the divided orifices of small circumferential vessels. In such a case the actual cautery applied to the cut surface will afford ample security against recurrence of bleeding.

Should the pedicle be sufficiently long to permit of its being secured between the edges of the abdominal wound by means of

an electro-gilt transfixing pin, the ends of the catgut (or other) ligature, instead of being cut off short, might be passed through the eye of the needle, and carried parallel to the vessels through the centre of the pedicle, so as to emerge at the cut surface, from which they could be withdrawn after the lapse of seven or eight days.

ART. XIII.—*On the Myoidema of Phthisis.* By LAWSON TAIT, F.R.C.S., Eng. (Exam.); F.R.C.S. and L.R.C.P., Ed.; Surgeon to the Birmingham and Midland Hospital for Women, and Surgeon to the Birmingham Lying-in Charity.

EVERY one engaged in out-patient hospital work has an experience only too sadly abundant of the various forms and stages of phthisis. From its very common occurrence, consumption is frequently regarded as a rather uninteresting disease, and the busy hospital officer usually sets down " only a case of phthisis," as something to be dismissed with cod oil and some cough mixture. For my own part I know of no disease of more intense clinical interest, and I know of very few for which so much can be done with success. So much interested have I felt in this disease that, removed directly though it is from the province of that branch of the profession to which my work inclines, I have devoted much time to the cases which have fallen under my care in hospital practice, and deem some of the results I have arrived at of sufficient importance to deserve a record in print. Whether others will agree with me in estimating the value I place upon them, further experience will show. The rough notes I here place before my *confreres* are not such as would be the work of a specialist, and as such demand an apology. The records of the cases are not such as I would recommend as models for the clinical student, but I trust that they will serve to interest some worker more diligent than I am to re-investigate the condition to be referred to.

When a student in the wards of the Royal Infirmary of Edinburgh, my attention was directed on many occasions by one of the most accomplished physicians of our day, Dr. Warburton Begbie, to a symptom found in cases of phthisis which went amongst us by the name of " muscular irritability." For this I have substituted the more exact name of *Myoidema*—a term which will explain itself, and indicates with more exactitude than any other the nature of the phenomenon. The symptom was first noticed by Drs. Graves and Stokes, of Dublin, and cannot be better described

than in their own words: [a]—" There is another highly interesting circumstance connected with percussion, which we do not think has as yet been described. Some time ago, on percussing a patient who had laboured under a pectoral affection, with several symptoms indicative of tubercular development, we were surprised to observe that after each stroke of the ends of the fingers a number of little tumours appeared, answering exactly to the number and situation of the points of the fingers, when they had struck the integuments of the chest. These having continued visible for a few moments, subsided, but could be again made to appear on repeating the percussion. In this case percussion excited a good deal of pain: the situation in which these little tumours were most apparent was in the sub-clavicular region, and over the great pectoral muscle. Since this observation we have seen the same phenomenon in a number of cases.

" How far this phenomenon may be connected with or depending on internal disease is yet to be ascertained. It is seldom met with unless in cases where the patients are emaciated to a certain degree. In these individuals we often find on percussion quickly and with some force, that after each blow a degree of pallor is observed in the parts struck, exactly answering to the points of the fingers; this is instantly succeeded by the return of redness and the erection of a little tumour, which has often a slightly quivering motion, and which subsides in the course of one or two seconds.

" We have observed this to occur most frequently in the superior and anterior portions of the chest, but have also met with it in other situations, such as the arms, back, &c. In some cases the patients complained much of pain on percussion, while in others they did not appear to suffer more than usual.

" This appearance seems to be owing to the contraction of muscular fibres, in consequence of the irritation of the blow."

Dr. Stokes adds further, in his book on *Diseases of the Chest*, note, p. 398:—" There is nothing in this muscular irritability peculiar to phthisis, but that it is commonly connected with irritation of the lung or pleura, there can be no doubt; and in this way, like the other signs of irritation, it becomes available in the diagnosis of phthisis. It is always more evident in the earlier periods; thus in incipient phthisis it occurs over the primary seat of irritation, while in the confirmed and chronic cases we may often find it absent over the lung first diseased, and strikingly marked on the side last and least engaged."

[a] Dublin Hospital Reports, Vol. v., p. 70.

After meeting with this phenomenon very many times I became satisfied that it possessed a real value, and to determine this I made a very extensive series of observations, and the general result is that I can confirm the opinions of Dr. Stokes save in a few particulars; while on many points I am enabled to advance explanations and give further indications of the value of this sign, which I am certain will prove trustworthy.

In a large out-patient practice I had ample opportunities of discovering when and where this symptom was to be met with, and for more than three years I seldom missed a day without making observations regarding it. During that time I had many cases of consumption under my care, all of which, I must regret, are not recorded, circumstances rendering it impossible for me to note them. Those that are, amounting to a hundred and seventeen, were taken indiscriminately, and the results of the examinations recorded week by week, without regard to any foregone conclusions. These cases are placed for convenience at the end of this paper, and when making any deduction the numbers of the cases on which it depends will be given for ready reference.

First of all, I ought to explain the nomenclature I have adopted. The sign itself I call " myoidema," because that word expresses what actually occurs when a local stimulus, such as a tap with the fore-finger, to a muscle, as shown in Marey's well-known experiments. The condition which enables the phenomenon to be visible I term, roughly and not very discriminately, muscular irritability. It ought to be termedi dio-muscular[a] hyperæsthesia. Carpenter thinks " it is doubtful whether both of these appearances (the nodule and the wave) are not due simply to a prolonged contraction of the muscle, resulting from exhaustion of its contractility at the excited spot."[b] This is sufficiently indefinite to convey no distinct meaning, and is an explanation the terms of which are somewhat contradictory. From clinical observation I am satisfied that it is really due to the normal contraction of a muscular fasciculus, freed in some degree from the inhibitory influence of nervous control. Muscles which show the phenomenon answer readily to the direct stimulus of the interrupted current, but not so to a current passed through the course of their nerves.[c] Micro-

<hr />

[a] *Idio-muscular* irritability is Schiff's term.

[b] Human Physiology, seventh edition, p. 775.

[c] This observation is one requiring further confirmation, as the experiments on which it is based are only three in number.

scopical examination of the muscular tissue, which in life has produced an intense nodule, shows nothing abnormal. Muscular tissue under the influence of paralysis, either recent or of long standing, does not necessarily give the myoidema, though in one most interesting case of phthisis, where there existed old standing paralysis of all the muscles of one shoulder, the result of injury, the atrophied remnants readily gave a marked nodule. That it is due to an altered nervous influence is also shown by the fact noticed by Stokes, and with extreme frequency by myself, that the production of a well-marked wave or nodule was accompanied by an amount of pain not commensurate with the severity of the stroke; and in many cases I found that a stroke which was intolerable during that period of the case when the nodule was readily produced was easily borne when recovery had so far advanced that the nodule could be produced only faintly or not at all.

Finally, when the idio-muscular contractility was exhausted by repeated stimulating taps on the same fasciculus, very soon it became impossible to produce the nodule until a period of rest had elapsed; and the readiness with which the exhaustion of the fasciculus was accomplished, and the length of the period of rest required, bore no appreciable relation to the intensity of the nodule, as we might have expected it would have done had Dr. Carpenter's explanation been correct.

What influence the state of the blood may have on this phenomenon, I have had no means of determining. Its clinical conditions will be afterwards alluded to.

The most common variety of the sign is the formation of an instantaneous sulcus at the point struck; and though this may be frequently met with in those apparently in perfect health, yet so strongly am I impressed with its clinical value, that I should look narrowly into the circumstances of any case for life insurance in which it was observed. This sulcus is due to the instantaneous travelling of a wave of contraction from the point struck to either end of the fasciculus to which the test is applied. The more marked the sign is the slower and more persistent does the wave become; rarely, however, is it so slow as to be observable by the eye until it is so intense as to form a secondary wave.

The second variety is where the nodule or intumescence of Stokes is formed. I have completely satisfied myself that this

nodule is produced when the waves of contraction, similarly to reflected waves in liquid, start from what ought to be their vanishing points, the ends of the fasciculus, and, passing in reversed directions, meet at or near their original starting-point, and become heaved up into a tumultuous or quivering nodule. The apparent struggle for mastery may sometimes be even seen under the skin, and the larger the waves and deeper the sulcus, the larger and more tumultuous the nodule. The nodule may be formed a little to one or other side of the point struck, and may even roll back and forward under the skin for a second or two, as if uncertain where to settle. Lastly, the disturbance may be so intense that a secondary wave may start from the nodule, and travel slowly (at least comparatively so) along in the direction of the primary wave in the shape of two small nodules. Auerbach tells us that he has noticed this, and that the rate of travelling of the divisions of the primary nodule was about eighteen inches per second. This phenomenon must be extremely rare, for I have only seen it twice, and then the rate did not seem to me to be more than four inches per second. The whole of the phenomena may be very easily imitated in a long, narrow trough of water. When therefore I speak of the irritability being merely *fascicular*, I refer to its most common and least serious form; when I say *nodular* I mean that the reflected wave produced a nodule, and this variety again I speak of being in some cases "intense." These terms are not exact, but they are convenient.

By far the most common seat for the ready production of a myoidema is the clavicular portion of the pectoralis major muscle; next, is the remainder of that muscle; next, the deltoids and the scapular muscles; and after that, though rarely, the muscles of the back. In one case (xxxvi.) it could at one time be readily produced in any of the muscles of the trunk, and even on the gluteus maximus. This was the only case where I ever saw a nodule on any muscle but the great pectoral; on the latter muscle it lasted twelve seconds. Usually the nodule disappeared in one or two seconds; but in several cases it will be found that it lasted longer (xix., xxiii., xxxvi., lxxx.). Stokes noticed the nodule last four seconds. In one case (liv.) I found fascicular irritability present on the deltoids, but entirely absent on the pectorals.

I have said that the fascicular irritability is often to be found in those apparently in sound health. Not so, however, with the nodule. I have not yet seen it in any one in whom there did not

exist serious disease. It is pre-eminently a sign of tubercular disease; and though I have made some hundreds of examinations to determine its presence or absence in cases not tubercular, I have failed to discover it in any but one other condition, typhoid fever. Even then it is met with usually only at one stage, and that is during the rapid emaciation which occurs immediately after convalescence has began, precisely at the time when the risks of a not unfrequent sequela of typhoid fever, consumption, are pre-eminent. The sign has on several occasions been of use to me in diagnosing the early stage of typhoid fever from the early stage of a case of acute phthisis (xxxix., lxvii., cxi.), two diseases that I have known confounded by most eminent physicians; and also in distinguishing softening tubercle from chronic bronchitis (lxxxiii.).

Further experience may show that I am over-estimating the value of the sign when I say that it is one of the most certain signs of phthisis; but I am perfectly convinced that every observation will confirm me in saying that it is an absolutely certain indication of softening deposit, and that in exact proportion to its intensity is the amount or rapidity of lung destruction, and the consequent gravity of the case. I regard tubercle in the lungs as of very little consequence unless it be in very excessive quantity or threatening to soften. There are two infallible indications of the latter—loss of weight and intensity of muscular irritability, and they invariably run together. Mere deposit of tuberculous matter does not necessarily involve loss of weight, or the ready production of the myoidema.

Dr. Stokes says that the irritability is more evident in the earlier periods, and that in incipient phthisis it occurs over the seat of irritation. The latter of these propositions is most certainly true, for with very few exceptions (xviii., xl., lvi., cv.) it has in my experience been always most marked on the side where the disease was most serious—that is, where the softening was most actively in progress at the time of examination (i., vii., x., xi., xiv., xvi., xxx., xlviii., &c.); and in many other instances (ii., iv., xxv., &c.) it has been absolutely confined to the side singly affected.

My experience, however, does not support Dr. Stokes' other proposition, that it is more evident in the earlier stages, for it becomes more intense along with the softening (vi., xi., xv., lxxi., xcix., &c.); and although it is often one of the very earliest physical indications of disease we get (xci., xciv.), it is only so when a very limited deposit is immediately followed by softening. I have seen cases of

enormous deposit in which no softening has occurred, and where no myoidema could be produced.

I have now under my care a lady who suffers from the deposit of fibroid phthisis to a degree quite as intense as did Martha H. (l.), but whose deposit has as yet undergone no softening. In her case I have never, in frequent examinations, been able to obtain even a sulcus; and yet there can, I think, be no doubt about the nature of the case, for I have watched it throughout its progress, and I sent her to Dr. Hughlings Jackson, without note or comment, and he has quite confirmed my opinion.

I have found the sign present, even in its most intense form (iii.), in cases where no physical signs of phthisis could be discovered (viii., ix., xiii., xx., xxxiii., xxxv.); but in all these the facts lead me to believe that they certainly were cases of consumption, and in one (iii.) it was proved to be so. The sign always appeared after marked loss of weight and the occurrence of the general symptoms of phthisis, and it disappeared as weight was gained and the symptoms abated. Every student of practical pathology knows how constantly we find softening tubercle in lungs which in life did not indicate its presence when examined. It is only at the apex of a lung that the presence of a small amount of tubercle can be absolutely determined. Thus I regard myoidema as a most valuable sign, for, taken along with marked loss of weight, it may explain things to us otherwise inexplicable.

I fear that few practitioners are aware what a really fearfully common thing tubercular disease of the lungs is, and how many cases there are that we miss for one that we discover. One comfort I may add to this, that the majority of practitioners have no very accurate notion of how many cases of consumption there are which recover—get well as absolutely as do cases of measles. My former master, Dr. Hughes Bennett, was looked on and scouted as a visionary when he talked of cases of tubercular disease of the lungs getting cured, and his preparations, showing the fact conclusively, were looked at with smiles of derision. Of my hundred and seventeen cases only twenty-six died, and many of these only after repeated recoveries. Of the ninety-one remaining I know that there are at least sixty still alive, and in good health. Of the remainder some few proved to be not phthisical, and some others certainly must have died; but the majority are probably still alive. I never saw conditions in any case that appeared more utterly hopeless than did at one time those of John M. (xliii.), yet

he is now in robust health. And here I cannot refrain from paying a tribute to Dr. Bennett for the boon he has conferred on us in bringing about rational views of the pathology and treatment of consumption. To him we are mainly indebted for the introduction of cod liver oil. In some of the cases it will be seen that cod oil could not be taken. In these I found the oil of the *arachis hypoyœa* a useful substitute. In a few the pancreatic emulsion was used with signal advantage.

In the investigation of the cases given I weighed every patient at each visit, a proceeding I would recommend to every out-patient hospital officer, if only from the fact that it saves so much time. I very soon found that on the dial plate of the weighing machine a far more ready index of the state of my patients than any descriptions of their own could afford me. I found that the increase of softening, the increase of muscular irritability, and the loss of weight always went together, save in the singular exception of Tom Braithwaite (c.), to be explained, I think, by his increase in weight from increase in height.

One other point observed by Dr. Stokes has been often confirmed in my experience, that " while in the confirmed and chronic cases we may often find it absent over the lung first diseased, and strikingly marked on the side last and least engaged." This is from the fact that there is a curious alternation of the sides on which softening occurs. Save in the last stage or in very acute cases, I have never seen softening going on at both sides at the same time; on the contrary, I have repeatedly seen a cavity in process of cure on the one side, while one was in process of formation on the other. In such a case the irritability will be found closely to accompany the softening. I have frequently (xlix., lxxiv., civ., &c.) predicted the occurrence of softening from the appearance of the nodule on the unaffected side. I have also been enabled to predict cessation of the mischief (lxxx.) from the disappearance of the nodule, even before there was any alteration of the physical signs or increase in weight. Deposit alone does not influence the weight or condition of the myoidema (xliii.). In one case (xii.) there certainly was no indication of phthisis; but the state is one in which I think it may be reasonably urged that there may have been some few patches of softening tubercle.

It may be urged that there is a want of explanation why softening tubercle should affect the muscles of the side alone to which it may be confined. I confess it is a mystery, but none greater than

that involved in the fact that if the inside of one thigh of a male
infant be tickled, the testicle of that side alone is raised; and in
connexion with this peculiarity of the myoidema of phthisis, I may
draw attention to the curious unilateral perspiration of Ellen R.
(xvi.). In several of the cases reference will be found to the filbert-
shaped nails and drum-stick fingers. The former is usually found
in connexion with tubercular disease of the lungs, and is usually
more marked, in chronic cases, on the side which is the more
affected by disease (xxx.). The drum-stick fingers, again, seem
peculiarly the property of chronic empyæma. I have seen them,
and, if my memory serves me rightly, so has Dr. Begbie, appear
in the course of an empyæma on the affected side alone, and dis-
appear after a cure had been effected.

I wish I had had the time and opportunity to write on many
other points concerning the clinical history and pathology of this
most interesting disease. I have already, however, transgressed
all moderate limits, and must only point to the case of Mary Daly
(xcii.) as one amongst many which has led me to believe that there is
a closer correlation of morbid actions than most of us believe; and to
the case of Elizabeth Richardson (civ.) as one of several which have
compelled me to believe that pulmonary consumption is contagious.

In order further to extend my experience of the value of the
myoidema, and to avoid any possible source of error, I examined a
number of the inmates of the West Riding Lunatic Asylum,
having been permitted to do so by the courtesy of my friend, Dr.
Crichton Browne. A table of these observations I append, and it
will be seen they fully bear out my former conclusions. Amongst
the insane phthisis is well known to be extremely prevalent, so
that it is not surprising to find fascicular irritability in a large per-
centage of the insane, and the nodule in many of those who, at the
time of examination, were losing weight.

At the head of that table will be found an observation that vocal
resonance is more marked on the right side, unless otherwise stated.
I believe that vocal resonance is normally more marked on the
right side than on the left, and that this is due to the anatomical
differences of the two sides. Of the cases where I could determine
the side on which the disease began, I find that there is an almost
equal number for the right and for the left. The statistics of some
authors show that the right side is more frequently the seat of the
origin of phthisis, while the statistics of others obtain the credit for
the left.

| No. | Age | Weight | | REMARKS |
		lbs.	—	[In all cases vocal resonance more intense on right side, unless otherwise stated]
1	49	—	—	Well nourished ; no irritability ; physical signs normal
2	60	152	losing	Well nourished ; muscular irritability faintly fascicular ; physical signs normal
3	30	146	steady	Well nourished ; muscular irritability faintly fascicular ; physical signs normal
4	30	158	gaining	Well nourished ; no muscular irritability ; physical signs normal
5	63	146	losing	Thin ; faintly nodular ; physical signs normal
6	30	136	losing	Well nourished ; muscular irritability faintly fascicular ; physical signs normal
7	60	126	losing	Thin ; muscular irritability very nodular ; physical signs normal
8	67	176	losing ?	Well nourished ; faint irritability ; physical signs normal
9	29	119	losing	Thin ; faintly nodular ; vocal resonance suspected left, but not decided
10	47	138	steady	Thin ; no muscular irritation ; normal
11	57	160	steady	Well nourished ; no muscular irritability ; normal
12	23	137	?	Well nourished ; no muscular irritability ; normal
13	21	127	steady	Well nourished ; no muscular irritability ; normal
14	78	159	steady	Thin ; no muscular irritability ; normal
15	56	133	steady	Thin ; muscular irritability more intense on left, where there are some suspicious signs (a case of acute mania)
16	46	157	steady	Fat ; no muscular irritability ; normal
17	29	175	slightly losing	Fat ; no muscular irritability ; normal
18	53	183	gaining	Fat ; no muscular irritability ; normal
19	45	158	?	Fairly nourished ; faintly fascicular ; suspicious (new case)
20	55	151	gaining	Fairly nourished ; no irritability ; normal
21	36	181	losing	Very fat ; no irritability ; normal
22	62	134	losing	Fairly nourished ; no irritability ; normal
23	65	174	losing	Fairly nourished ; faintly nodular ; normal
24	31	148	steady	Fairly nourished ; no irritability ; normal
25	36	140	gaining	Well nourished ; no irritability ; normal
26	36	143	losing	Thin ; muscular irritability nodular ; slight softening at both apices
27	40	136	gaining	Very thin ; muscular irritability intense on left pectoral, absent on right ; advanced disease at left apex, probably in process of cure ; voice intensified on left side.
28	43	148	losing	Fat ; no irritability : normal
29	47	157	losing	Fairly nourished ; muscular irritability very nodular on right ; faint on left ; slight disease at right
30	35	110	gaining	Fairly nourished ; no muscular irritability ; slight bronchitis
31	34	136	?	Fairly nourished ; no irritability ; normal
32	45	154	losing	Thin ; muscular irritability nodular ; suspicious at both apices
33	21	148	steady	Fat ; no irritability ; normal
34	30	152	steady	Fat ; no irritability ; normal
35	38	148	gaining	Fairly nourished ; no irritability ; normal
36	24	126	steadily losing	Fat ; no irritability ; normal
37	48	134	losing	Fairly nourished ; slightly nodular on left pectoral slight softening at left apex
38	31	140	losing	Fairly nourished ; no muscular irritability ; normal
39	10	76	steady	Fairly nourished ; no muscular irritability ; normal
40	25	153	gaining	Thin ; no muscular irritability ; normal
41	17	—	—	Thin ; deposit on right side, and muscular irritability nodular on right pectoral

No.	Age	Weight lbs.	Weight —	REMARKS [In all cases vocal resonance more intense on right side, unless otherwise stated]
42	23	151	losing	Thin ; irritability of muscles nodular ; suspicious at both
43	37	134	losing	Fairly nourished ; faintly nodular ; normal
44	33	148	gaining	Well nourished ; faint ; normal
45	51	165	gaining	Well nourished ; no irritability ; normal
46	52	128	losing	Thin ; intensely nodular ; advanced disease at both apices
47	54	123	gaining	Fairly nourished ; no irritability ; normal
48	51	142	steady	Fat ; no irritability ; normal
49	34	145	gaining	Fat ; no irritability ; normal
50	46	140	losing slightly	Fairly nourished ; no irritability ; normal
51	58	159	losing	Fairly nourished ; no irritability ; normal
52	49	153	steady	Fat ; no irritability ; normal
53	35	147	gaining	Fairly nourished ; no irritability ; normal
54	25	127	slightly losing	Fairly nourished ; no irritability ; normal
55	43	171	steady	Fat ; no irritability ; normal
56	31	141	gaining	Fairly nourished ; muscular irritability intensely nodular on right pectoral ; dulness, immobility, and deficient breath-sounds under right clavicle
57	31	155	steady	No irritability ; normal
58	30	138	steady	No irritability ; normal
59	27	161	losing	Irritability nodular ; voice sound more marked on left
60	58	148	steady	No irritability ; normal
61	45	149	steady	Irritability nodular
62	20	136	gaining	No irritability ; normal
63	15	140	gaining	No irritability ; normal
64	38	129	losing	Irritability nodular ; vocal resonance more intense on left
65	42	171	gaining	No irritability ; normal
66	44	157	steady	No irritability ; normal
67	46	180	gaining	No irritability ; normal
68	28	165	gaining	Fat ; no irritability ; normal
69	28	165	gaining	Fat ; no irritability ; normal
70	50	142	steady	Fat ; irritability nodular ; normal ; chronic dimentia
71	39	150	gaining	Fat ; no irritability ; normal
72	29	193	steady	Fairly nourished ; no irritability ; normal
73	47	159	gaining	Fat ; no irritability ; normal
74	44	136	gaining	Fairly nourished ; no irritability ; normal
75	69	136	steady	Fairly nourished ; no irritability ; normal
76	53	126	steady	Fairly nourished ; no irritability ; normal
77	74	132	losing	Fat ; no irritability ; normal
78	72	151	losing	Muscular irritability nodular on both sides ; cavity on right side
79	45	154	gaining	Fat ; irritability nodular ; normal
80	57	153	steady	Thin ; normal ; nodular irritability ; dimentia
81	60	131	gaining	Fat ; irritability nodular ; normal
82	65	152	gaining	Thin ; irritability nodular ; faint crackle on left
83	42	174	gaining	Fat ; no irritability ; normal
84	67	129	gaining	Fat ; no irritability ; normal
85	16	114	steady	Fat ; no irritability ; normal
86	15	100	gaining	Fairly nourished ; no irritability ; normal
87	49	159	steady	Fairly nourished ; no irritability ; has had suspicions of tubercle
88	81	128	losing	Thin ; irritability nodular ; no signs
89	20	117	gaining	Fairly nourished ; irritability nodular, equal on both sides ; slight disease on left
90	43	130	gaining	Fairly nourished ; irritability nodular

Case I.—M. B., aged forty-six, sempstress, has had chronic phthisis for eleven years; decided dulness under the right clavicle, with deficient breath sound and increased vocal resonance; muscular irritability nodular on the right pectoral, very slight on the left; marked on the scapular muscles of both sides.

Case II.—Barbara W., aged fourteen, has double spinal curvature and phthisis; marked dulness for some distance below the left clavicle, with deficient breath sound; right lung free from disease, and probably voluminous from altered relation of chest walls; muscular irritability very nodular on the left pectoral, but not present at all on the right.

Case III.—Thos. B., aged ten, has no special physical sign; he has a look of abdominal disease, but no symptom of it; there is intense muscular irritability of the right pectorals, and to some extent of all the muscles of the trunk and limbs, and always most marked on the right side. This patient was seen only once, but I have since learned that he died, very soon after I saw him, of acute softening of the lungs.

Case IV.—Mary Ann O., aged twenty-four, married, has had irregular and painful menstruation since the birth of her last child, which occurred about four years ago, but has not menstruated at all for four months past; there is slight dulness under the right clavicle, together with slightly nodular irritability; no sign on the left side. This patient was under observation six weeks, and gained two pounds in weight without any alteration of the signs.

Case V.—Isabella W., aged fifty-six, has had symptoms of chronic phthisis for sixteen years; she had a considerable deposit in the supra-spinous region of the right side, and nodular irritability of the right pectoral; she gained 1 lb. in two months, while taking arsenic, without any alteration of the signs.

Case VI.—Elizabeth T., married, weighed, on Nov. 26, 96 lbs.; she had then extensive consolidation of the right apex. On Dec. 3 she had gained a pound under the use of cod liver oil, when an attack of softening came on, and on Jan. 28 she was reduced to 91 lbs. During this time I remember that there was a considerable degree of muscular irritability, but unfortunately I have made no note of it. On Feb. 4 she had gained ground, and

weighed 94½ lbs., but another attack of softening came on, which proved fatal on April 1st. For a fortnight before her death the muscular irritability was so excessive that the slightest tap on any muscle produced instantaneously a nodule, which lasted several seconds.

CASE VII.—Esther H., aged twenty-seven, a factory worker, has been ill two years; there is slight dulness and diminished respiration under the left clavicle; there is intense muscular irritability of the left pectoral, the slightest tap raising a large nodule, while it is with some difficulty that the nodule can be produced on the right side.

CASE VIII.—Walter C., aged seventeen, has been growing very rapidly for about six months; he has lost his appetite; has a cough, and sweats very much during the night; he feels certain that he has lost weight considerably; he weighs (on the 1st of February) 101 lbs.; there are no physical signs of disease, but the muscular nodule is raised with great readiness on all the muscles of the right side of the trunk; on the left side it is much fainter. By the use of cod liver oil and a tonic he had gained by the end of the month 5 lbs., and then the irritability almost entirely disappeared.

CASE IX.—Ann O., aged twenty-six, has been losing weight; has a cough and night sweats; she is an ill-fed hand-loom weaver; there are no physical signs of disease, save faintly nodular irritability of the pectorals; on Feb. 4 she weighed 111 lbs.; under the use of cod liver oil she rapidly improved, and was dismissed at her own request on the 18th, having gained 3½ lbs.

CASE X.—Harry R., aged nine, a shade of dulness under the left clavicle, together with deficient breath sounds and increased vocal resonance; muscular irritability most on the left pectoral; he cannot take cod oil, so he put on the ground nut oil (*arachis hypogœa*); in a month he gained 2 lbs., and was dismissed cured.

CASE XI.—Timothy T., aged sixty-two, has been a hewer, weighed on the 17th Feb., 134½ lbs.; under the left clavicle there is some flattening and great dulness; the vocal resonance is much increased and breath sound almost absent; the nodule is easily raised on the left pectoral, but can scarcely be got on the right; on

March 24th he weighed 130½ lbs.; on April 7th, 126 lbs., and then the nodule could be raised easily everywhere; softening of the upper part of the left lung advanced rapidly, and he died on April 25th.

Case XII.—Benjamin H., a clerk, aged nineteen, has been losing health and strength for twelve months; he has very large bunches of enlarged lymphatic glands in each axilla and in each groin. On microscopical examination the blood is found to be normal; muscular irritability is very general, and the nodule is easily raised under both clavicles. Feb. 17th, he weighs 98½ lbs., and is ordered cod oil; 25th, the oil has quite destroyed his appetite, and he weighs now only 96 lbs.; ordered ground nut oil. March 10, cannot take the nut oil; weighs 94 lbs.; ordered pancreatic emulsion. March 24, weighs 100½ lbs.; glands much less; muscular irritability much diminished; general health much improved. April 7, weighs 104 lbs.; muscular irritability quite gone. April 14, weighs 106 lbs.; dismissed cured.

Case XIII.—Elizabeth T., aged thirteen, weighs (Feb. 24) 84 lbs.; has the general symptoms, but no physical signs of phthisis; seems to be a good specimen of what has been described as the "pre-tubercular" condition; the nodule can be easily produced on both pectorals; ordered cod oil. March 17, weighs 84 lbs. Not seen again.

Case XIV.—Mary G., aged fourteen, a well marked case of acute phthisis; she has been ill only six weeks, and now presents the appearance of being far advanced in the disease; she weighs (Feb. 24) 74½ lbs.; there is flattening, dulness, and advanced softening at both apices, but decidedly the greater amount of disease is on the right side; the muscular irritability is very considerable everywhere, but more nodular on the right pectoral than on the left; ordered small doses of opium. March 30th, the attack of softening has gone off; she weighs 80 lbs., and thinks she is well enough for her work; the irritability still remains, but is equal on both pectorals.

Case XV.—John P., aged sixteen, a worker amongst greasy wool, has been unwell for six months. Dec. 10, he weighs 127 lbs.; on the left side there is flatness under the clavicle, together with dulness reaching down to the cardiac area, the apex

bruit being rather higher than usual; he has frequent hæmoptysis; the vocal resonance is distinctly intensified; the breath sound is deficient and has very markedly the character of the *respiration saccadé*, and the muscular irritability is well marked on both sides. Feb. 4, he weighs 132 lbs.; all the signs have diminished in intensity, more especially the dulness on percussion, which has cleared wonderfully; the muscular irritability is much diminished; the upper half of the left lung expands much more freely, and, most remarkable of all, the apex bruit is now in its normal position; general symptoms much improved, appetite good, and instead of spitting blood every week, as he used to do, he has not done so for six weeks. March 3rd, he weighs 137 lbs.; the muscular irritability is quite gone, and all that remains of his former condition is slight cogwheel breathing at the left apex. Discharged in perfect health and weighing 136 lbs. on April 14. He has used cod oil and a tonic all through the attack. Seen again on Sept. 28, 1868, weighs $125\frac{1}{2}$ lbs.; there is deposit at both apices, with softening at the left; intense muscular irritability on both pectorals; cannot take oil; ordered emulsion. This attack is due to carelessness, and its evidently serious character to the fact that he has been ill some weeks, and has been taking herbs. Saw him last on Dec. 7th, when he weighed 126 lbs.; softening was advancing rapidly at both apices, and the muscular irritability was intense. He died some time in February.

Case XVI.—Ellen R., has been ill for seven weeks; the catamenia ceased three months ago; there is a considerable deposit at both apices, which on the left side is undergoing softening; there is more marked irritability of the left deltoid and pectoral than of the right. Dec. 31, weighs $97\frac{1}{2}$ lbs.; ordered cod oil. Jan. 7, cannot take the oil; given nut oil instead; weighs $96\frac{1}{2}$ lbs. Feb. 11, cannot take the oil; ordered pancreatic emulsion; weighs 95 lbs. March 3rd, weighs 92 lbs.; muscular irritability very great on every muscle of the trunk, the nodule lasting for many seconds on the pectorals of both sides. She states that she sweats very much, but only on the right side of the body, the right side of the face being frequently very wet, while the left is quite dry. On April 7th she weighed 90 lbs., and she died on the 20th.

Case XVII.—Elizabeth A., aged twenty-five, has not menstruated for ten weeks; under the right clavicle there is slight

dulness, increased voice sound, harsh breathing almost tubular, and a slight crackle on a very deep inspiration; there is no muscular irritability. She gained $3\frac{1}{2}$ lbs. in two months under the use of chalybeates and cod liver oil.

Case XVIII.—Ann L., aged twenty-one and a half, has been ill eight months; great flattening and immobility of the left clavicular and mammary regions, and distinct evidence of a large cavity; faint muscular irritability, which is more intense on the right side than on the left.

Case XIX.—Joseph T., aged sixteen, evidence of deposit at both apices, more intense on the right; muscular irritability very intense, the nodule lasting eight seconds on the right side and five on the left. This case was only seen once, but I have since learned that he died in a few days of acute softening.

Case XX.—Dorothy P., aged thirteen, Nov. 19, weighs 71 lbs. Against her name there is nothing written save the word " phthisis," and a record of the fact that the muscular irritability was nodular everywhere. On Feb. 4 she weighed 77 lbs., and it is recorded that there were no physical signs and the irritability gone. Discharged on the 24th.

Case XXI.—Brian M'D., labourer, aged twenty, has been losing health for two years. Jan. 4th, weighs 132 lbs.; has cough and night sweats; there is marked dulness extending downwards four inches from the left clavicle, together with immobility and flattening of that part of the chest, and a good deal of crackling can be heard; the muscular nodule is very easily raised on both pectorals and deltoids. Feb. 25, weighs $136\frac{1}{2}$ lbs.; muscular irritability much diminished; physical signs not altered. July 24, the heart's apex now beats above and considerably to the inside of the nipple, and a fresh deposit occupies nearly the whole of the left lung, small districts in the axilla and at the lateral and posterior base alone giving a clear note, and even over these crackling is heard; muscular irritability much more intense on the left side than on the right; weighs 123 lbs. This deposit slowly softened, and he died on Feb. 20.

Case XXII.—George W., aged thirty-two, pitman, weighs on Feb. 11th, 140 lbs.; advanced disease at both apices, and intense

muscular irritability of all the muscles of the trunk. He lost weight steadily until April 21, when, as he lived at a distance, we lost sight of him. He probably died soon after.

Case XXIII.—Hannah P., aged twenty-four, married, of a dark complexion and with very bad teeth and general scrofulous appearance, suffers from enlargement of the concatenate glands of the neck. Feb. 11, weighs 129 lbs.; muscular irritability faint on all the chest muscles; no signs of chest disease. March 31, in spite of cod oil she has lost 10 lbs., and now the muscular nodule is easily raised on the left pectoral and with slight difficulty on the right; the former lasting four seconds, the latter disappearing instantly; there is dulness to some extent under both clavicles, least on the right side; and at the left apex there is softening going on. She has missed her menstrual period for the first time. April 21, weighs 118 lbs.; muscular irritability almost equal on both sides; there is now markedly interrupted breathing and moist sounds at both apices. Lost sight of her after that date, but have since learned that she died.

Case XXIV.—John S., aged eighteen, a painter, has been rapidly losing flesh for some weeks; has profuse night sweats; he eats well. During the physical examination of his chest, the *phthisical odour* was so intense as to be very offensive; there were no signs of pulmonary disease, but the muscular nodule was raised with extreme readiness on the pectorals—more so on the right than the left. May 6th, he weighed 104 lbs.; urine contains sugar in appreciable quantity. June 2, weighs 113 lbs. June 16, weighs 110 lbs. On examination it is found that since the 2nd there has been a deposit formed under the right clavicle, and that it is now softening; the muscular irritability is nodular on both sides, but is markedly more lasting on the right. June 23rd, the condition of the right apex is much improved, and the irritability is less. Under treatment. He ultimately recovered completely.

Case XXV.—Jane N., aged seven, has slight dulness under the left clavicle; muscular irritability nodular on the left pectoral, not visible on the right. Recovered after an attack of softening.

Case XXVI.—Grace S., aged thirty-eight, hand-loom weaver, has been ill for six months; she has not menstruated for six

months.   May 20, weighs 101 lbs.; phthisical odour most offensive; dulness to an intense degree extends from the left clavicle into the cardiac area, and over this area no breath sound can be heard either at back or front, the only sound being a faint crackle on very deep inspiration.   The vocal fremitus can scarcely be distinguished over the upper half of this lung, while the voice sound is much exaggerated.   On the right side the breathing is slightly jerky; the muscular nodule is easily produced on both sides, but more easily on the left pectoral muscle, and there it continues longer.   June 2, weighs $97\frac{1}{2}$ lbs.; the crackling is abundant all over the area of dulness.   June 9, the area of dulness has contracted slightly, and the apex beat is higher than normal; weighs 96 lbs.   June 23, weighs $97\frac{1}{2}$ lbs.; not menstruated yet.   July 7, weighs 100 lbs.; 21st, weighs 99 lbs.; not menstruated; muscular irritability very intense on both pectorals; considerable consolidation at the right apex and much crackling.   Aug. 4, well marked crack pot above and below left clavicle, and considerable consolidation at the right apex; muscular irritability intensely nodular on both sides; 99 lbs.; Sept. 1, 98 lbs.   Not seen again, but I have heard that she died.

CASE XXVII.—Emma L., aged seventeen, has menstruated very irregularly for twelve months; *respiration saccadé* under the left clavicle, and the voice sound intensified there; muscular irritability not nodular, but decidedly more on the left pectoral than on the right.   March 17th, weighs 104 lbs.   April 14, weighs 109 lbs.; muscular irritability very faint on both pectorals, but still more apparent on the left; it has diminished very much since last examination; the physical signs have improved.   May 26, weighs 106 lbs., and is in much the same condition as in the last note, except that the voice sound is now louder on the right side than on the left.

CASE XXVIII.—Anne B., aged seventeen, sempstress, has only menstruated twice in five months; no distinct physical signs; filbert-shaped nails on both hands, but more so on the fingers of the right; muscular irritability present on both sides, but more particularly on the left.   March 16, weighs 98 lbs.; 24th, 102 lbs. April 21 (had menstruated on the 15th), 99 lbs.   May 5th, weighs 101 lbs.; muscular irritability gone.   July 7, weighs $96\frac{1}{2}$ lbs.; considerable dulness behind and above the right clavicle and deficient

breath sounds. Aug. 4, 95 lbs.; state of signs as last described; muscular irritability nodular on both pectorals. Sept. 15, 98 lbs.; physical signs much improved, air entering the right apex tolerably freely; no muscular irritability.

CASE XXIX.—Alice D., aged twenty-nine, May 25, 122 lbs., has been ill for three months; general symptoms do not indicate phthisis, as her appetite is good and she has no night sweats; the wall of the upper front of the left side is quite fixed and very flat, and here there is a large cavity which gives the most intense *bruit de pot felé* that I have ever heard; muscular irritability very faint. May 25th, weighs 122 lbs. June 23, weighs 125½ lbs.; the cavity has very much contracted, the crack-pot sound instead of being most intense at the level of the third rib can now only be got immediately under the inner third of the clavicle; and the cavity is much dryer than it was formerly. Aug. 18, 128 lbs.; cavity contracting; muscular irritability entirely absent. Sept. 22, 131½ lbs.; apex beat of heart much elevated; pulmonary abnormal sounds almost gone; no *bruit de pot felé;* no muscular irritability. Nov. 24, 137 lbs.; no signs of fresh disease. I have frequently seen this patient since, and she is quite well.

CASE XXX.—Dorothy D., aged eighteen, a mill hand, working amongst greasy wool, was weighed in October last, and remembers that she was 147 lbs. June 14th, weighs 113 lbs.; she has filbert-shaped nails on the left hand, but not on the right; she suffers from cough, night sweats, and a bad appetite; immediately behind and above the right clavicle there is considerable dulness, while the supra-scapular region partakes of it slightly; here the breathing is cavernous, and there is well marked pectoriloquy, but no moist sounds save after a cough; this side is much contracted and quite immobile; the clavicle is much lower than the left, and the hollow above it much deeper than that on the other side; on the left side there is jerky respiration and tubular breathing, with some dulness; the muscular irritability is distinctly greater on the left side than on the right. Last Christmas she suffered from an attack similar to this, and indicates the right supra-clavicular region as then having been the seat of pain; now she suffers at the same spot on the other side. The condition is evidently that there is a cavity in process of cure on the right side, and one in process of formation on the left. This

patient ultimately recovered thoroughly, but unfortunately the notes of her progress have gone astray.

Case XXXI.—Sabina H., aged eighteen, mill girl, March 3, weighs 113 lbs.; slightly jerk respiration at left apex; faint muscular irritability of the scapular muscles. May 26, has been taking pancreatic emulsion; weighs 108 lbs.; some friction sounds and slight dulness at the left upper scapular region and a faint crackling; muscular irritability faintly visible everywhere; can't take oil; ordered pancreatic emulsion. June 16, 109½ lbs. July 21, 112 lbs.; slight leather creak at right apex; no muscular irritability. Oct. 20, 117 lbs.; signs quite normal.

Case XXXII.—Hamer T., aged thirty, soap worker, May 8, weighs 127 lbs.; muscular nodule on both pectorals; slight cogwheel breathing under both clavicles; he has occasional hæmoptysis. June 9, weighs 125 lbs.; muscular irritability more nodular than before, and now most on left side. June 23, weighs 124 lbs.; a faint crackle to be heard at the right posterior apex; streaky expectoration. July 21, 126 lbs.; a faint crackle at right post apex; muscular irritability nodular on both pectorals. Aug. 4, 122 lbs.; crackle at right post apex increased; muscular irritability faint on right pectoral; in *statu quo* on left. Oct. 27, 120 lbs.; the deposit at the right post apex must be increasing, for the breathing there now is very rough and almost tubular; muscular irritability increased on right side and scarcely visible on left. Dec. 29, has been much in the state last described until now; weighs 119 lbs., and cannot take the oil; ordered the ætherized oil. Jan. 12, softening has taken place at the right post apex; muscular irritability intensely nodular everywhere; he can take the ætherized oil well. Feb. 9, 115 lbs.; muscular irritability very nodular on left, faint on right; 23rd, 120 lbs.; softening passed off; muscular irritability faintly nodular everywhere.

Case XXXIII.—Tom B., aged fourteen, has been losing flesh for three months; has a cough and occasional night sweats; no physical signs of disease; muscular irritability nodular on left side, faint on right. July 6, weighs 112 lbs.

Case XXXIV.—John S., aged thirty-five, plasterer, has been ill for six months; there is dulness, deficient breath sound, and

prolonged expiration under the right clavicle; muscular irritability equally nodular on both sides; some crackling at right posterior apex; occasional hæmoptysis. July 7, weighs 111 lbs.

Case XXXV.—William J., aged nine, has been losing flesh for five months; muscular irritability very nodular on both sides; no physical signs of disease. May 1, weighs 47 lbs. July 13, weighs 49 lbs.; muscular irritability almost gone. Aug. 8, 51 lbs.; muscular irritability gone. Oct. 27, 53 lbs.

Case XXXVI.—William S , aged sixteen, a cooper, has been ill for four months. March 9, weighs 105 lbs.; there is intense dulness for nearly four inches below the right clavicle, and the chest walls here are quite fixed; marked pectoriloquy and tubular breathing. On the left side there is evidently deposit, but to no great extent, there being only some slight interruption to the breathing, and perhaps a shade of dulness. He has been losing flesh very rapidly for a fortnight; his father and a brother and sister have died of phthisis. There is the most intense amount of muscular irritability I have yet seen; on the slightest tap an enormous nodule rises on the pectorals, lasting twelve seconds on the right side and six on the left; nodules can be easily raised on the deltoids (this is the only instance where I have seen them on this muscle), scapular muscles, latissimus dorsi, and even on the gluteus maximus. April 7, weighs $109\frac{1}{2}$ lbs.; muscular irritability nodular on both pectorals, but its duration much diminished. April 21, to-day a most interesting series of changes is noticed; the muscular irritability is much diminished on both sides, but is still more apparent on the right than on the left; on the left side the breathing is almost normal; while on the right the chest is much more morbid than formerly, and the intense dulness now ends abruptly at two inches from the clavicle, but over this region the breathing is markedly tubular, and there is a good deal of crackling. This must be the disease under process of cure, because though his cough is worse he has gained 2 lbs. within the last week. April 28, to-day the dulness extends only one inch from the right clavicle, the crackling has entirely gone, the breathing cavernous, and there is the most intense pectoriloquy. We have now a cavity undergoing contraction. May 5, weighs 113 lbs.; pectoriloquy less marked. May 26, weighs $113\frac{1}{2}$ lbs.; dulness still diminishing, breathing slightly tubular; muscular irritability almost gone.

July 14, physical conditions and weight the same; muscular irritability quite gone. Not seen until June 25, weighs $107\frac{1}{2}$ lbs.; a large cavity under the right clavicle and some mischief going on under the left. The slightest tap raises a very large nodule, which lasts for eight seconds on the right pectoral. There is a nodule on the left, but scarcely so big or persistent. He died during the attack.

CASE XXXVII.—John R., aged five and a half, muscular irritability decidedly more marked on the left side than on the right. The whole of the left lung emits a peculiar sound, which is probably bronchial, complicated by friction from patches of tubercle; the whole side duller than the opposite. Only seen once. I heard afterwards that he died.

CASE XXXVIII.—John L., aged forty-three and a half, deficient movement, with dulness and crackling under the left clavicle; vocal resonance much increased; muscular nodule easily raised everywhere. This was a poor drunken destitute wretch, who soon sunk under the softening.

CASE XXXIX.—Joseph D., aged sixteen and a half, has been losing flesh rapidly; has night sweats and severe cough; bad appetite; no physical signs of chest disease; muscular irritability intense everywhere; temperature 102 Fahr. In this case it was difficult to decide, as it often is, whether we had to do with a case of acute tubercle in its very early stage or with one of typhoid fever. The weighing proved it was the latter, because on June 4th he weighed only 93 lbs., while on the 19th he weighed 99 lbs.—a rate of increase at his age, together with a diminution of temperature to $98\cdot2$, totally at variance with the idea of a tubercular condition.

CASE XL.—George S., aged forty-four, has suffered for years from cirrhosis of the liver; there is dulness, deficient breath sounds, and slight crackling under the left clavicle; muscular irritability much more apparent on the right side than on the left. June 11, weighs 132 lbs. Subsequent history not known.

CASE XLI.—Sarah W., aged twenty-four and a half, *respiration saccadé*, with slight dulness under left clavicle; muscular irritability nodular on left pectoral, faintly so on right.

CASE XLII.—James M., aged twenty-six, says that he weighed

147 lbs. a few weeks ago; he weighs now (June 16) only 130 lbs.; deficient motion, slight dulness, and faint crackling above the left clavicle; muscular irritability intense everywhere. July 3, muscular irritability much diminished; physical signs much improved; weighs 134 lbs.

CASE XLIII.—John M., aged sixteen, weighs (Feb. 20) $100\frac{1}{2}$ lbs.; *respiration saccadé* at both apices; muscular irritability intense on all the chest muscles. March 20, weighs 109 lbs.; muscular irritability almost disappeared, but still nodular on the right side, where the altered breath sound still remains; breathing normal on the left. April 3, weighs 112 lbs.; condition of the signs much improved. The boy unfortunately discontinued the treatment and went to work, and re-appeared on the 22nd of June, weighing 103 lbs.; marked cogwheel breathing and crackling at both apices; muscular irritability intense everywhere; complains of being very weak; temperature 100° Fahr. July 27, $98\frac{1}{2}$ lbs.; considerable fresh deposit has occurred at the right posterior apex; muscular irritability intensely nodular; temperature 102·2°. Aug. 7, 105 lbs.; right apex much improved, although the air is not entering freely; faint crackling is to be heard at left post apex; muscular irritability equally nodular on both pectorals. Sept. 25, 112 lbs.; the amount of deposit in the right lung is slowly increasing, but no softening has taken place; muscular irritability more on right than left. Jan. 1, the deposit seems also to have spread in the left lung, and an attack of softening is occurring there; muscular irritability intensely nodular on left, scarcely visible on right. Jan. 8, $110\frac{1}{4}$ lbs. The softening is passing off; the respiration being almost puerile, with but faint crackling; muscular irritability very faint on right and much less on left. He recovered completely.

CASE XLIV.—Joseph C., aged sixteen, has disease of the mesenteric glands, probably tubercular; flattening of the chest wall and wavy respiration at the left apex; muscular irritability well marked on left pectoral; faint on the right.

CASE XLV.—James M., aged twenty, weighs on Jan. 2, 112 lbs.; has completely lost his appetite; has severe cough and night sweats; intensely nodular irritability of both pectorals; faintly wavy respiration on the left side. Jan. 31, weighs $129\frac{1}{2}$ lbs.; muscular irritability much diminished; general symptoms much improved. Dismissed cured on February 14, weighing 135 lbs.

Case XLVI.—Alfred F., aged thirty-seven and a half, has been ill for six months; there is advanced disease at both apices, especially on the left, where the upper lobe of the lung is quite solid; muscular irritability intense everywhere; weighs 127 lbs., May 22. On May 29 he had lost 3 lbs., and I learned that he died on June 22.

Case XLVII.—Thomas W., aged forty, February 7, weighs 168 lbs.; there is considerable flattening with distinct dulness, deficient breath sound, and faint crackle under the left clavicle; muscular irritability nodular on left side, both back and front, while it is indicated on the right side only by a faint sulcus on the pectorals. May 1, weighs 170 lbs.; physical signs slightly improved, general symptoms very much so; muscular irritability still nodular on left side, but it cannot be induced on the right side at all.

Case XLVIII.—James M., aged sixteen, Dec. 27, weighs 123 lbs., and is 5 feet 8 inches in height; has lost a brother lately from phthisis; harsh and slightly interrupted breathing at the right apex; muscular irritability well marked on the right side, but faintly so on the left, and on both sides it is more apparent on the deltoids than on the pectorals. Jan. 24, weighs 128 lbs.; muscular irritability decidedly increased on both sides, and now it is more apparent on the left pectoral, where a nodule may be raised; physical signs not altered. May 1, weighs 127 lbs.; condition not altered.

Case XLIX.—Philip F., aged thirty-four, on July 13, 1867, was found to have a large cavity at the apex of the left lung, with very fœtid expectoration; muscular nodule raised with great ease on the left side, but with great difficulty on the right. In February he weighed 133 lbs., and it was found that the cavity had contracted very much and was very dry; the muscular irritability was then marked on both sides, but especially on the left. On June 5 he weighed 123 lbs. Aug. 14, 123 lbs. The cavity at the left apex is contracting, and the disease on the right side, where there seems to have been an attack of softening lately, is, no doubt, in process of cure; muscular irritability nodular on right pectoral, not on left. Feb. 11, physical signs much as formerly, no muscular irritability.

Case L.—Martha H., aged sixteen, with silky hair and regular teeth; weighs on March 6, 110 lbs.; there is a large deposit of

tubercle at the base of the right lung, where there is some softening
and probably a small cavity, indicated by localized tubular breathing
on a level with the lower angle of the scapula, with considerable
increase of vocal resonance; no muscular irritability anywhere;
night sweats, diarrhœa, hæmoptysis; ordered cod oil and dilute
sulphuric acid. March 13, has gained 1 lb. She unfortunately
discontinued treatment until May 29, when it was found that she
weighed only 109 lbs., and the physical signs were as follows:—
At the posterior base of the right lung there was a space beginning
at the lower angle of the scapula and extending into the hepatic
dulness, extending also from the vertebral column round the great
angle of the ribs for six inches, throughout which there was intense
cavernous breathing and pectoriloquy, both increasing in intensity
as the centre of the space was neared; round the edges of this
space the dulness was very marked, but as the centre was ap-
proached it decreased rapidly in intensity until over a limited area,
a tympanitic note was obtained, which partook largely of the *bruit
de pot felé* character when the mouth was applied to the ear;
muscular irritability faintly nodular everywhere; cannnot take
oil, so pancreatic emulsion is ordered. June 5, weighs 108½ lbs.;
finds that she can take fat much better since she took the emulsion.
June 19, weighs 106 lbs. July 3, weighs 109½ lbs.; appetite
much improved; the area of the signs above mentioned has con-
tracted a good deal and their intensity is much diminished; *bruit
de pot felé* scarcely audible; muscular irritability much fainter.
Aug. 14, an attack of softening is going on round the cavity;
muscular irritability intensely nodular; 28th, 109 lbs.; it has now
passed off, and the muscular irritability is much fainter; the cavity
is much larger in extent than formerly. Oct. 23, 104 lbs.; the
cavity is no less, but is quite dry; no muscular irritability. Feb. 5,
98½ lbs. There is again softening going on round the cavity, and
now muscular irritability is intensely nodular on both pectorals.
She recovered from this attack, the cavity healed, and she is now
quite well.

Case LI.—Hannah H., aged forty-three and a half, has been
ill two years. April 6, weighs 108 lbs.; considerable deposit
undergoing softening at both apices; muscular irritability nodular
everywhere; night sweats, severe cough, bad appetite. Discharged
almost well on June 6, weighing 112 lbs.

Case LII.—Mary Ann P., aged thirty-one, has slight deposit

and softening at right apex; muscular nodule raised with more ease on the right side than on the left.

Case LIII.—Emma T., aged twenty-two, a brunette, with regular teeth, coarse hair, and painful, scanty menstruation, which has only occurred once in the last seven months; very extensive consolidation in the anterior apex, but no softening; no sweating, appetite good. She was under observation for two months, during which time she lost little ground, as she took the oil and tonic well, but, I believe, she died of acute softening not long after discontinuing treatment.

Case LIV.—M. A. S., aged twenty, a brunette, with fine hair and very beautiful teeth; menstruation painful; has been losing flesh, and has cough and night sweats; marked *respiration saccadé* at the left apex; slight dulness and exaggerated voice sound at the right apex; muscular irritability slight on both deltoids; weighs, Jan. 10, 120 lbs. Feb. 14, weighs 118 lbs.; the jerky breathing now discernible on the right side; no alteration of the muscular irritability.

Case LV.—Florence C., aged seventeen and a half, weighs on March 25th, 120 lbs.; menstruated regularly until last November, but since then her periods have been deficient and painful; not much cough; occasional night sweats; the supra-clavicular region of the right side is deficient in mobility, is slightly dull on percussion, and the vocal resonance is markedly exaggerated; left side normal; muscular irritability nodular on the right pectoral, altogether absent on the left; ordered *aloes and iron pills* to be taken during menstruation, and cod liver oil and small doses of iron to be taken between the periods. April 23, has menstruated freely and without pain; weighs 123 lbs. Discharged on May 8th quite well.

Case LVI.—Sarah H., aged sixteen and a half, suffers from cough and night sweats; deficient motion and respiratory murmur at the left apex; muscular irritability more perceptible on the right side. This patient lost 4 lbs. in a week, and was not seen again.

Case LVII.—Ellen S., aged fifteen, has marked dulness and crackling under the right clavicle; muscular irritability nodular on

right pectoral, altogether absent on left; present on the muscles of both scapulæ.

CASE LVIII.—Julia Teal, aged twelve, suffers from cough, night sweats, and loss of appetite; there exist flattening, dulness, and much exaggerated vocal resonance under right clavicle, together with a faint crackle; muscular irritability nodular on right side, very faint on left.

CASE LIX.—Sarah W., aged twenty and a half, suffers from the general symptoms, and a year ago had a severe attack of hæmoptysis; her grandfather died of phthisis; both apices considerably, and almost to the same extent, occupied by a softening deposit; muscular irritability faintly nodular on both pectorals, and to be seen faintly on the scapular muscles of both sides; weighs, May 1, 125 lbs. July 17, physical signs very much improved; only a faint crackle to be heard under the left clavicle; muscular irritability extremely faint. On Aug. 14 she re-appeared, weighing only 121 lbs.; an acute attack of softening has been going on under the right clavicle, but is now apparently under process of cure; muscular irritability faintly nodular; she is also suffering from a papular eruption on the intestinal mucous membranes, evinced very markedly on the tongue and by constant intestinal pain after food and vomiting; ordered cerii oxal. Sept. 6, 123½ lbs. Sept. 25, 127½ lbs.; slight crackling at right front apex; muscular irritability very faint. Nov. 6, 130 lbs., and has not been seen since Feb. 22, though I have heard that she is well.

CASE LX.—Isabella J., aged thirty-one, has been ill eight months; there is a large cavity and a good deal of progressive softening under the left clavicle; the muscular nodule is easily produced on both sides, and lasts nearly eight seconds. This patient died.

CASE LXI.—Anthony H., aged forty-six, weighs, Feb. 14, 127 lbs.; indications of commencing disease, and intense muscular irritability on the left pectoral; he took cod oil steadily until June 5th, when he weighed 138½ lbs., and all the signs had vanished. July 17, weighs 142½ lbs.

CASE LXII.—Sarah H., aged twenty, has never menstruated; appearances of general struma; respiration saccadé under left

clavicle; deficient breath sound and slight dulness; muscular irritability faintly nodular on left pectoral. (A younger brother of this girl died under my care lately of tubercular meningitis.) She now weighs (July 10) 92½ lbs.; ordered cod oil and compound syrup of the phosphates. Aug. 7, 95½ lbs.; physical signs the same; muscular irritability very faint. Sept. 30, 100 lbs.; muscular irritability and signs entirely gone. Dec. 8, 101 lbs; discharged cured.

Case LXIII.—Mary Ann S., aged twenty-seven, July 15, deficient movement and breath sound, and faint crackle at the right post apex; muscular irritability slightly more persistent on right pectoral than left.

Case LXIV.—Helen H., aged twenty, slight dulness and deficient breath sound under the left clavicle; slight muscular irritability on the left pectoral.

Case LXV.—James P., aged twenty-seven, May 15, weighs 115 lbs.; muscular irritability very nodular everywhere, and equal on both sides; advanced softening on both sides, most extensive on the left, where there is a large vomica giving the bruit de pot felé; ordered oil and ac. hydrocyan. June 5, weighs 120 lbs.; on the right side the breathing is almost normal, no softening, but the chest expands deficiently; on the left there is faint crackling under the left clavicle, and circumscribed but intense pectoriloquy and faint bruit de pot felé, showing that the cavity is contracting and the disease in process of cure; muscular irritability very faint. June 12, 123½ lbs.; muscular irritability quite gone. July 24, 121 lbs.; slight softening is going on round the vomica under the left clavicle; muscular irritability nodular on the left pectoral, very slight on the right. Sept. 11, 124 lbs. Recovered completely.

Case LXVI.—Mary H., aged thirty-four and a half, deficient movement, slight dulness, and absence of respiratory murmur under right clavicle; muscular irritability very faint on both pectorals.

Case LXVII.—John D., aged twenty-five, July 23, weighs 102 lbs., and says that he has lost 16 lbs. in a very short time; general symptoms point to the deposition of tubercle; muscular

irritability intensely nodular everywhere. Aug. 4, saw him at home, and attended him till the 13th, through an attack of softening in both lungs, the course of which very much resembled that of typhoid fever. Aug. 14, 101½ lbs.; muscular irritability much diminished. Not seen again, but I have learned since that he is alive and quite well.

CASE LXVIII.—John P., aged twenty-nine, weighs 137 lbs.; wavy and deficient respiration at the left apex, with increased vocal resonance; four months ago had an attack of hæmoptysis; muscular irritability very faint on both sides. Feb. 16, weighs 139 lbs. Recovered.

CASE LXIX.—Emma E., aged forty-six and a half, suspicious alteration of the breath sounds under the left clavicle; muscular irritability much more intense and lasting on left pectoral than on right; general symptoms vague.

CASE LXX.—Mary A., aged seventeen and a half, rough and deficient breath sounds under the left clavicle, and deficient movement of that side; faint muscular irritability on both sides.

CASE LXXI.—Elizabeth Wright, aged twenty-two and a half, Aug. 26, irregular menstruation; it has not appeared for ten weeks; some softening deposit under both clavicles, but most under right; muscular irritability faintly nodular on both sides; weighs 128 lbs.; ordered pancreatic emulsion, as she cannot take oil. Sept. 18, 124 lbs.; muscular irritability very nodular; 25th, 125 lbs.; muscular irritability much fainter. Oct. 2, 121 lbs.; muscular irritability nodular. Not seen again. I have since learned that she died in November.

CASE LXXII.—John Shepherd, aged thirty-five, July 7, weighs 111 lbs.; dulness, deficient breathing, and prolonged expiratory murmur under the right clavicle; voice sounds normal; muscular irritability equally nodular on both sides; some crackling and considerable deposit at the right post apex; night sweats; occasional hæmoptysis; appetite good; ordered sulphuric acid and oil. July 24, 115½ lbs.; has had no hæmoptysis; appetite good; night sweats gone; dulness more intense at right post apex, and evidence of a limited cavity; muscular irritability slightly nodular verywhere; faint crackle at left post apex. Aug. 11, 117 lbs.;

muscular irritability very faint everywhere; physical signs much improved. Sept. 21, 119 lbs.; very well. Oct. 6, 116 lbs.; an attack of softening has supervened, which extends through the whole substance of the lung for about five inches from the right clavicle; there is but very faint muscular irritability. Nov. 3, 111 lbs.; softening still going on; muscular irritability faint on left, marked on right pectoral. He died some months after.

Case LXXIII.—George Reading, aged thirty-two, May 16th, prolonged expiratory murmur at left apex, slight dulness and cogwheel breathing; weighs 156 lbs.; muscular irritability faintly nodular on both pectorals; ordered quinine with a little opium and oil. Oct. 6, considerable deposit under both clavicles, with advanced softening, and a cavity behind the left clavicle; muscular irritability very nodular on both pectorals; weighs 142 lbs. He died in a few weeks.

Case LXXIV.—Emma Cooper, aged eighteen, March 10, weighs 106 lbs.; catamenia missed for the first time; muscular irritability slightly nodular on left pectorals; slight dulness under left clavicle, and some softening deposit. July 21, 102 lbs.; muscular irritability nodular on right pectoral, faint on left; abundant deposit and softening on left side. commencing mischief on the right side. She ultimately recovered completely.

Case LXXV.—Harriet France, aged twenty and a half, July 28, faintly wavy breathing and slight dulness under the right clavicle; muscular irritability faint everywhere.

Case LXXVI.—John Green, aged thirty-five, general symptoms suspicious; no physical signs except that under the left clavicle; the voice sound is intensely exaggerated; muscular irritability intensely nodular on left pectoral, and much less on right.

Case LXXVII.—Joshua Watson, aged twenty-two, faint, dry crackle at right post apex; muscular irritability intensely nodular on both pectorals. Died after removal to the sea-side.

Case LXXVIII.—Eliza Sledge, aged twenty-two, Aug. 4, 105 lbs.; suffers from severe dysmenorrhœa, the periods being six weeks and the discharge scanty; deficient breath sound at the right apex; very slight muscular irritability on right pectoral;

ordered oil and aloes and iron. Sept. 15, 113 lbs.; menstruates regularly and without pain; no physical signs.

CASE LXXIX.—Richard Broughton, advanced disease at the left apex, especially at the post apex; muscular irritability intensely nodular everywhere. This man was found dead in bed the morning after this note was taken—death resulting, probably, from some cardiac cause.

CASE LXXX.—Wm. Jackson, a very handsome lad, 5 ft. 11 in., aged eighteen, weighs 163 lbs.; at the right apex there is deposit and softening; left clear; muscular irritability very nodular on right pectoral, nodule lasting six seconds and only three on the left; ordered quinine, iron, and oil. Jan. 5, 161 lbs.; softening has passed off; rest quite clear, and muscular irritability almost disappeared. I predict that he will gain much weight in the next week. Jan. 12, 164 lbs.; muscular irritability quite gone. Jan. 26, 166 lbs.

CASE LXXXI.—Isabella Vickers, aged thirteen and a half, advanced disease at the right apex, and some at the left; no muscular irritability.

CASE LXXXII.—Joseph Chadwick, Aug. 3, 113 lbs.; muscular irritability nodular on both sides, but decidedly more intense on the right, at which apex there is a shade of dulness, diminished breath sound, increased vocal resonance, and respiration saccadé; respiration saccadé on left side. Aug. 10, 110 lbs.; condition almost the same. Sept. 1, 114 lbs.; abnormal signs quite gone; muscular irritability scarcely visible. Nov. 7, 116 lbs.; normal, muscular irritability very faint. Jan. 12, 120 lbs.

CASE LXXXIII.—Mary Ann Holdroyd, aged nineteen. This patient has been repeatedly under care during the last three years for what was called chronic bronchitis; the physical signs were very doubtful; they were all over the chest. Dec. 7, weighs 128 lbs.; muscular irritability faint. Jan. 5, 131 lbs.; much improved; 19th, 132½ lbs. Feb. 2, the same sounds are present again, but as the muscular irritability is quite nodular on the pectorals, and she weighs 128½ lbs., I pronounce it to be a case of phthisis. Such it ultimately proved on *post-mortem* examination.

CASE LXXXIV.—Elizabeth Parker, aged thirty-two, Dec. 7,

121 lbs.; has lost father, a brother, and two sisters from phthisis; the upper third of the right lung is occupied by tubercle, and there is a considerable cavity in the front and towards the manubrium; wavy respiration at the left apex; muscular irritability very slightly nodular on right pectoral and absent on left. Dec. 22, 116½ lbs.; a good deal of softening going on at the right apex and slight at the post left; muscular irritability nodular on right pectoral, faint on left.

Case LXXXV.—James Robertshaw, aged thirty-two, Nov. 2, rough, wavy respiration at both apices, slightly tubular at the right post apex; muscular irritability intensely nodular on pectorals. Nov. 4, this patient was attacked by tubercular meningitis, and died on Nov. 10. *Post-mortem* examination revealed very slight disease at the right apex.

Case LXXXVI.—Bridget Smith, aged forty-three, general symptoms of phthisis. Nov. 23, 125 lbs.; suspicions of deposit at the left apex, where there is immobility and a shade of dulness; muscular irritability absent. Jan. 19, 125 lbs., and as the patient has not altered the least in weight, and there is no muscular irritability, I am inclined to believe that it has not been a case of phthisis, and that the condition at the left apex is either a scar or an anatomical peculiarity.

Case LXXXVII.—George Oberhouse, a native of Strasbourg, Oct. 17, 114 lbs., 5 ft. 4½ in.; there is an extensive condensation at the upper part of the right lung; at the extreme apex there is a small cavity; at present there is no softening; left apex quite clear; muscular irritability not very well marked, more so on right pectoral. Dec. 1, 128½ lbs.; not the least muscular irritability; 15th, cavernous breathing at both apices. Dec. 29, 136 lbs. Jan. 19, 141 lbs. Feb. 2, 137 lbs.; muscular irritability; 16th, 138½ lbs.; muscular irritability very faint. Ultimately died from fungous tumour of the dura mater.

Case LXXXVIII.—George Crowther, aged thirty, Aug. 4, 132 lbs.; deficient breath sound under right clavicle; faint muscular irritability on both sides. Oct. 13, 139½ lbs.; physical signs almost normal; only a faint dulness under the right clavicle; muscular irritability very faint. Nov. 8, 142 lbs.; physical signs

quite normal; muscular irritability extremely slight. Dec. 22, 144½ lbs.; all the conditions normal.

Case LXXXIX.—John Milling, aged forty-four, Nov. 10, 126 lbs.; advanced disease at both apices, recent softening at the left; muscular irritability intensely nodular on both sides, the nodule lasting longer on the left. Dec. 1, 131 lbs.; muscular irritability much less marked; breath sounds much clearer. Feb. 2, 135 lbs.; muscular irritability very faint, air entering fairly.

Case XC.—Ada Reed, aged thirteen, brought to me for an opinion; she is in the last stage of consumption, and the muscular irritability is intense, the very slightest tap raising a nodule.

Case XCI.—Walter Smith, aged seven, Feb. 27, 1869, weighs 49½ lbs.; general symptoms suspicious, but no indications of chest disease from physical signs; muscular irritability intensely nodular on both sides. March 16, 51 lbs.; muscular irritability nearly gone; April 20, 53½ lbs.; muscular irritability quite gone.

Case XCII.—Mary Dayly, aged twenty and a half, Oct. 27, 114 lbs. This girl was under my care many months ago for a very severe and obstinate attack of sciatica of the right nerve. Three months after she passed through an attack of acute rheumatism (not under my care), from which there results a murmur of mitral regurgitation. There is now considerable deposit and softening at the right apex; general symptoms not urgent; no muscular irritability. Nov. 24th, 119½ lbs.; breath sounds very much improved at the right apex; no muscular irritability. Jan. 12, 122 lbs.; quite well. Feb. 23, spinous process of the seventh dorsal vertebra is abnormally prominent, and she complains of pain when it is manipulated. Ultimately recovered well.

Case XCIII.—James Sykes, aged twenty-three, Feb. 16, advanced disease on both sides; muscular irritability intensely nodular, and undulations spreading rapidly from the nodule in each direction along the fasciculus. The skin immediately after the stroke becomes the peculiar pink I have sometimes noticed (is it similar to the tache cerebrale of Trousseau?); weighs 114 lbs.

Case XCIV.—George Wraith, aged twelve, Jan. 26, 73 lbs.; suspicions of tubercle, although neither the signs nor symptoms

are definite; muscular irritability intensely nodular. Feb. 16, muscular irritability much less nodular. Recovered completely without further symptoms.

Case XCV.—Annie Boyer, aged nineteen, Jan. 24, 106 lbs.; traces of old disease at both apices, and probably a small cavity at the inner third of the right clavicle; no muscular irritability.

Case XCVI.—Jane White, aged twenty-nine, Jan. 21, 115½ lbs.; sent to me with the statement that she has phthisis, but I can find no signs nor symptoms to warrant the belief, and there is no muscular irritability. Feb. 23, no signs nor muscular irritability, and weight continues the same; a case of hysteria.

Case XCVII.—Mary Hurst, aged thirty-four and a half, deficient movement, dulness, and absence of respiratory murmur under right clavicle; muscular irritability faint.

Case XCVIII.—John Wildsmith, aged fourteen, Feb. 1, 71½ lbs.; from the history given it would seem that he has been suffering from an attack of softening; the apices of both lungs are clear, but at the right posterior apex there is a faint crackle, and at the right posterior base there is abundant evidence of softening; muscular irritability is intensely nodular on both pectorals. Feb. 9, general symptoms much improved; weighs 73 lbs.; muscular irritability much more faint than at last visit, and is scarcely perceptible on the right side. Feb. 23, 75 lbs.; muscular irritability very faint; no abnormal sound anywhere.

Case XCIX.—Ellen Walsh, aged eighteen, July 14, 93½ lbs.; evidence of deposit and commencing softening at both apices; muscular irritability nodular on both pectorals; 28th, 91 lbs.; the softening has advanced considerably; muscular irritability intense. Sept. 22, 97½ lbs.; no moist sounds; fixidity and slight dulness of the right apex; no muscular irritability. Nov. 24, 98 lbs.; cannot retain oil; ordered pancreatic emulsion. Dec. 29, 100 lbs.

Case C.—Tom Braithwaite, aged nineteen, July 6, the general symptoms are very suspicious, and he has been losing flesh very much of late; there are no physical signs, but the muscular irritability is nodular on left side and faintly so on right; 112 lbs.; 21st, 114 lbs.; no physical signs; muscular irritability fainter on

left and nearly equal.   Aug. 4, 118 lbs.; muscular nodule faint on right, persistent on left, and under the left clavicle the breathing is slightly wavy.   Sept. 1, 120½ lbs.; muscular irritability much increased, and some suspicious sounds at right posterior apex. Sept. 5, 121 lbs.; very harsh breathing at the left apex, and some moist crackling at the right; muscular irritability nodular, and most on right pectoral.   Oct. 20, 124 lbs.; breathing on both sides normal; muscular irritability not nodular, but most marked on right side. Jan. 12, 125½ lbs.; slight crackling at the left apex; muscular irritability very nodular on both sides; 26th, 127 lbs.; the softening has passed off; muscular irritability very faint.

CASE CI.—R. Keethley, aged seventy-two, Feb. 1, 103 lbs.; an old cavity at the right apex of large size, and some softening at the left; muscular irritability intensely nodular.   Died soon afterwards.

CASE CII.—Amos Harberton, aged nineteen, Jan. 4, 85 lbs.; has a limited effusion of fluid at the base of the left lung; I see no reason for believing that it is tubercular save that there is intense muscular irritability of both pectorals; general symptoms not suspicious.   Feb. 26, 86 lbs.; there is now a similar effusion at the base of the right lung, and muscular irritability is intensely nodular.   I have since learned that this patient died of well-pronounced phthisis.

CASE CIII.—Wm. Brook, aged nineteen, Jan. 22, 137 lbs.; general symptoms of phthisis; signs at the apices normal, but softening going on at left post base; muscular irritability very faint on both pectorals.   Feb. 26, 137 lbs.; signs as before.   Subsequent history unknown.

CASE CIV.—Elizabeth Richardson, aged fourteen, Sept. 10, 85 lbs.; none of this girl's family have been known to have phthisis, but she has slept for some time with a girl affected with phthisis; there is deposit and softening at both apices, but principally at the right, where it is most at the back, and where the voice sound almost amounts to pectoriloquy; muscular irritability very nodular everywhere, and slightly more lasting on the left pectoral.   Oct. 9, 84 lbs.; there is now a large cavity at the right apex, giving well marked crack-pot sound; muscular irritability is much more marked on right pectoral than on left.   Nov. 6,

89 lbs.; muscular irritability much less than when last noted, and physical signs improved. Dec. 4, 85 lbs.; some softening has been going on round the cavity, and also at left apex; muscular irritability intensely nodular. Jan. 15, 89 lbs.; softening still going on; muscular irritability intensely nodular. Feb. 5, 91 lbs.; softening passed off; muscular irritability very faint. She died some months afterwards.

Case CV.—Mary Wray, aged twenty-six, Jan. 26, 112 lbs.; general symptoms present, softening at the right apex; muscular irritability slightly nodular, more on left than right. Feb. 26, 116 lbs.; physical signs much improved; no muscular irritability.

Case CVI.—John Walker, aged twelve, Feb. 5, $62\frac{1}{2}$ lbs.; this boy has been losing flesh lately to a considerable extent; moist sounds are scattered over the chest, of which it is difficult to say whether they are tubercular or bronchial; the general symptoms are in favour of the tubercular view, but there is no dulness anywhere, and the voice sound is intense at the right apex as usual; the muscular irritability is very faint, much more so than it would be if all the softening were going on which would be indicated by the character and extent of the moist sounds. The subsequent progress of the case showed it to be one of subacute bronchitis.

Case CVII.—Thomas Womack, butcher, aged nineteen, Feb. 2, 113 lbs.; advanced softening at both apices, most at the left, where muscular irritability is intensely nodular, much more so than on the right; voice sound louder at the right; 26th, 117 lbs.; muscular irritability faintly nodular on both pectorals; condition much improved at the apices.

Case CVIII.—Emma Wright, aged forty-four, July 17, 94 lbs., extensive deposit at right apex, which underwent partial softening in December, 1867; muscular irritability is intensely nodular everywhere. September 25, $93\frac{1}{2}$ lbs., in *statu quo*. January 15, 102 lbs.; muscular irritability has almost disappeared, and the breath is entering the right apex very freely. February 26, 101 lbs., very faint, muscular irritability, breath sounds almost normal. (The softening in this case, if it actually occurred, must have been so slow and gentle as to escape notice.)

Case CIX.—James Frith, aged twenty-four, February 18, 121 lbs., muscular irritability intensely nodular at both apices; an old cavity at the left, and much deposit at the right, and possibly a small cavity. He is still alive and comparatively well.

Case CX.—Joseph Corkson, aged thirty-one, February 26, 153 lbs., softening at both apices, but most at left; muscular irritability faintly nodular at both apices, but more so at left; voice sound most marked at left apex.

Case CXI.—George Morely, aged forty-four, January 2, 126 lbs. This patient was sent to me as a case of bronchitis, and it might have passed as such but for the intensely nodular muscular irritability on both sides. The apices are quite clear, but the basis are both occupied by tubercle, the right beginning to soften; ordered oil and milk. February 5, 133 lbs., sounds almost gone, and muscular irritability very much fainter. This enormous increase of weight, in little more than a month, makes it certain that it is a case of phthisis.

In connexion with the above case, I may mention another which I saw on February 2, in consultation with Dr. Sykes, of Heck-mondwicke. It had been seen by several careful observers, and had been set down to a variety of diseases. The first sign I tried was muscular irritability, and it was so peculiar that I at once expressed the opinion that there was tubercle somewhere. We found it at the base; but the apices, where it had been looked for before, were quite clear. He was shortly afterwards seen by my friend, Dr. Allbut, of Leeds, who pronounced a perfectly independent opinion that it was a case of acute phthisis, and death proved it so.

Case CXII.—Ann Rickerdyke, aged twelve and a half, January 7, 59 lbs., softening at the right apex, left clear; muscular irritability faintly nodular at both sides; 15th, 62 lbs., moist sounds gone, and muscular irritability quite disappeared.

Case CXIII.—Albert Laird, aged twenty, December 3, 120 lbs., condensation at both apices (but no softening), principally at the right; muscular irritability most intense on right pectoral; 18th, 115 lbs., muscular irritability more intense. January 8, cannot take ordinary oil, ordered the ætherized; 114 lbs.; muscular irritability intensely nodular, the slightest tap raising a large

nodule, from which a wave passes slowly along the fasciculi to each insertion; 15th, condensation increasing, but no softening; muscular irritability so great that the arm is jerked violently inwards and forwards when the pectoral is struck. February 5, 114 lbs., muscular irritability only faintly nodular. He afterwards gained weight rapidly and recovered perfectly.

Case CXIV.—Thomas Vizard, aged twenty-four, December 18, 131 lbs., deposit and softening at both apices; intense nodular irritability on both apices. Died.

Case CXV.—Hannah Robinson, aged thirty-two and a half, October 8, 113 lbs., deposit and slight softening under the left clavicle, the apex being less mobile, duller, and the supra-clavicular fossa more marked than the other; the disease is principally at the first apex. The voice sounds are markedly more intense on the right side, especially in front.

Case CXVI.—Thomas Dews, aged sixty-two, May 7, 140 lbs., dulness, deficient breath sounds on right side; muscular irritability nodular on both sides. June 26, 143 lbs., much improved; muscular irritability almost gone. July 23, 143½ lbs., faint crackling above the right clavicle; muscular irritability nodular on right side. October 16, 142 lbs., softening of deposit has been going on; muscular irritability very intense on right side, faint on left. 30th, breath sound at right apex normal; muscular irritability very faint on both sides. Discharged cured.

Case CXVII.—Mary Dolan, aged twenty-eight, June 9, 104 lbs.; advanced disease on both sides, rather more on left; intense muscular irritability rather more on left; catamenia had not appeared for six months until last week, and had been irregular for two years. July 24, not menstruated again; physical signs in *statu quo*; muscular irritability equal on both sides.

Art. XIV.—*Analysis of* 1,100 *Cases of Skin Disease.* By Walter G. Smith, M.D., Dubl.; Fellow and Censor, K. & Q.C P.I.; Assistant Physician to the Adelaide Hospital.

Whatever opinions may be held as to the propriety of establishing special hospitals and dispensaries for restricted groups of cases, the advisability of developing opportunities for the special study of particular classes of disease *in connexion with a general hospital* will

scarcely be questioned. In the year 1868 arrangements were made
at the Adelaide Hospital, for the first time, so far as I know, in a
Dublin hospital, for setting apart one day a week for the observa-
tion and treatment of diseases of the skin exclusively. From that
time to the present, this plan has been regularly adhered to, and
the advantages derived from it at least justify its continuance.
Within a few months a student may study all the more common
examples of cutaneous disease. In September, 1869, a register of
the cases was opened, and has been continued almost without a
break to the present date; and I purpose now giving the tabulated
results of the working of this branch of the dispensary.

A printed form of prescription paper was adopted which was
found to conduce to the regularity of the attendance. The plan of
the register is designedly simple; on the left-hand page are three
columns, for the number of the case; name, age, and sex; occupa-
tion, name of the disease, duration, &c. The right-hand page is
left free for notes of the treatment, progress of the case, &c.

The attendance each day averages at present about twenty-three,
the proportion of males and females being nearly equal—the former
slightly in excess. About one-half are new cases, the rest being
patients from preceding weeks. Without going into tedious
details attention will be briefly drawn to any detached points that
seem of special interest, and particularly to the therapeutical means
which have proved of most practical moment.

The cases, it will be seen, amount to more than 1,100, a suffi-
ciently large number to serve as a basis for estimating, among
other matters, the relative frequency of nearly all the recognized
forms of cutaneous disease among the poorer classes, and for com-
parison with the data furnished from other sources. But, in any
tabular statement of cases, certain errors, and discrepancies from
the results of other observers, are almost inevitable, and, in some
instances, the numbers will necessarily be less exact than in others.
For, some terms are loosely applied, *e. g.*, pityriasis; between other
genera there does not seem to be an absolute distinction, *e. g.*,
furunculus and anthrax; and even in some of the more common
affections the precise nomenclature may excusably vary among
different practitioners. Again, it is often far from easy to decide
on the syphilitic or non-syphilitic character of a skin disease, and
in not a few cases of psoriasis and eczema, and in many cases of
ulcer, it is difficult to range them under their true headings—some
authorities ascribing a much wider field to syphilitic influences

than others. Moreover, difficulties occasionally arise in the diagnosis of some of the commonest diseases, e. g., scabies, tinea circinata, pityriasis, &c.; it is uncertain what share is to be allotted to a cause like " pedicularia;" and lastly, a few diseases frequently escape notice on account of their trifling character, e. g., herpes facialis, or from occurring in covered parts and giving rise to little or no annoyance, e. g., leucoderma and tinea versicolor. Though all these circumstances vitiate to a greater or less extent the results of numerical statement, yet, after all allowances, a fair approximation to the truth can, with adequate care, be made.

In the subjoined lists, when two distinct diseases, e. g., scabies and psoriasis, co-exist, they are reckoned separately; but, so far as possible, secondary complications of a primary disease, e. g., prurigo complicated with impetiginous pustules, or, the consequences of neglected scabies, are not separately enumerated. Occasionally, e. g., under erythema, well marked varieties or forms are separately classed. Relapses occurring within a short period are not taken into account; but, in a few cases, a recurrence of the disease after a period of, say, twelve months, has been entered as a fresh case. In addition, a few cases taken from the wards of the hospital are included, some of which were admitted from the dispensary.

This leads me to remark that great disadvantages attend the exclusively extern treatment of skin diseases, and the absence of any organized system of baths and other suitable appliances is a serious deficiency which it is to be hoped will be soon remedied in our hospitals.

Disease		Age	No.	Per Cent.	Males	Females	Remarks
Abscess	-	—	13	1·15	4	9	
Acne							
(a) indurata	-	16 to 60	30 ⎫		⎧ 22	8	17 above 20 years, 13 above 25 years. Stated by some to be more common in females.
				2·9			
(b) rosacea	-	28 to 32	3 ⎭		⎩ 1	2	
(c) simplex	-	13 to 36	17	1·5	7	10	All below 20, except one.
Alopecia	-	6 to 44	4	—ᵃ	1	3	Including 2 cases of alopecia areata, aged 6 y. and 36 y., both females.
Anthrax	-	21 to 76	9	—	6	3	5 were 45 y. or above it; 2 on lip or chin.
Aphthæ	-	1 to 3	3	—	3	—	
Burns	-	2 to 34	9	—	6	3	
Canities	-	18	1	—	1	—	A white patch developed gradually 4 years previously on a dark brown head of hair.

ᵃ NOTE.—Percentage when under 1 per cent. is not given.

Disease	Age	No.	Per Cent.	Males	Females	Remarks
Carcinoma -	46, 50	2	—	1	1	
Corns -	—	1	—	1	—	
Cysts -	8, 30	2	—	2	—	
Ecthyma -	1 to 50	17	1·5	9	8	Some of the cases were possibly syphilitic, and sometimes not easy to distinguish from furunculus.
Eczema[a] -	all ages, 2 m. to 70 y.	209	18·5	115	94	About 50 were impetiginous (i. e., pustular); about 25 were infantile eczema of the head, from 3 years downwards. Half the cases of E. rubrum were over 35, especially among females. Very few distinctly vesicular cases.
Erysipelas -	47	1	—	—	1	
Erythema						
(a) circinatum -	9 to 18	3		—	3	
(b) nodosum -	7 to 56	14		3	9	Sex not stated in 2 cases. 9 below 14 y., 3 at 17 y., 1 at 30 y., 1 at 56 y.
(c) papulatum -	2 to 70	12	3·28	7	5	9 under 30 y., 1 at 46 y., 1 at 70 y. 2 cases of copaiba rash.
(d) pernio -	5 to 11	3		1	2	Occurred in Jan.—March, 1870.
(e) simplex -	3 to 20	5		1	4	
Exanthemata (see rubeola, varicella, &c.)						
Furunculus -	1½ to 60	12	1	9	3	Males all above 20 y. except 1 at 14 y.; females 1½ y., 5 y., and 60 y.
Herpes						
(a) symptomaticus -	4 to 54	13	1·15	6	7	Males all below 12 y. except 2; females all above 12 y. except 1.
(b) zoster -	3 to 60	15	1·33	6	8	Sex not stated in 1 case. Males all 10 y. or over it except 1; females between 9 y. and 26 y. except 1.
Hydroa ? -	38	1	—	—	1	
Hyperidrosis -	70	1	—	—	1	
Ichthyosis -	24, 29	2	—	2	—	The 2 patients were brothers, and had the disease from infancy; parents free from it.
Impetigo (excluding I. contagiosa)	9 m. to 70 y.	56	5	32	24	Only 2 under 1 y.; from 1 y. to 5 y., 23; from 5 y. to 20 y., 17.
Keloid -	32	1	—	—	1	A fibrous growth developed in a cicatrix on the elbow (Alibert's keloid).
Leucoderma -	29, 50	2	—	2	—	In 1 case the pubic hair was black and white in alternate zones.
Lichen (including strophulus)	3 w. to 80 y.	51	4·5	26	25	Under 1 y., 10; from 1 y. to 5 y., 13; from 20 y. upwards, 22.
Lupus -	3 to 70	7	—	2	5	1 case at 3 y.; the rest 30 y. and upwards.
Miliaria ? -	32	1	—	—	1	
Molluscum sebaceum -	8 to 69	4	—	3	1	
Nævus -	—	4	—	1	3	Probably congenital in all.
Neuralgia -	23 to 70	4	—	3	1	In 2 cases, consequent on herpes zoster, 6 w. and 3 m. previously.

a NOTE.—If we adopt the views of those who hold that eczema, pityriasis, scabies, lichen, impetigo, and gutta rosea form a natural group, the " eczematous affections " would amount to over 37 per cent. But I cannot coincide in this opinion.

Disease	Age	No.	Per Cent.	Males	Females	Remarks
Pedicularia -	—	5	—	4	1	Not including *eruptions* due to this cause, but simply cases of abundant vermin on pubis, head, or arm-pits.
Pemphigus -	1 to 24	9	—	3	6	
Pityriasis (excluding tinea versicolor)	3 to 56	21	1·87	9	12	Nearly half were 30 y. or upwards; only 2 below 5 y.
Porrigo (impetigo contagiosa)	4 m. to 60 y.	81	7·2	39	42	Under 1 y., 5; 1 y. to 5 y., 34; 5 y. to 15 y., 34.
Prurigo (including pruritus)	13 to 87	89	8	41	48	From 40 y. and upwards, 71; mostly females. No female case below 25 y.; more than half above 60 y.
Psoriasis (lepra; alphos)	10m. to 87y.	49	4·35	22	27	Below 20 y., 23, chiefly females; from 20 y. to 35 y., 21, leaving 5 above 40 y., all males except 1; 3 cases in very young children were perhaps syphilitic.
Purpura -	2½ to 45	8	—	5	3	All under 15 y. except 2.
Roseola -	—	1	—	—	1	
Rubeola -	2 to 19	7	—	4	3	No case above 8 y. except 1.
Scabies -	2 m. to 60	86	7·6	44	42	Below 1 y., 4; from 1 y. to 5 y., 12; from 5 y. to 20 y., 30; from 20 y. to 35 y., 20; above 35 y., 16; age not stated in 4.
Scrofuloderma (including strumous glands)	2½ to 40	29	2·57	18	11	Only 3 exceeded 20 y.
Seborrhœa -	3 m, 5 y.	2	—	1	1	
Syphilida						
(a) condylomata -	4 to 47	9	0·8	2	7	3 were above 30 y.
(b) secondary rashes & ulcers	3 m. to 43 y.	52	4·6	30	22	Below 1 y., 5; from 1 y. to 7 y., 7; 20 y. and upwards, 36.
(c) tertiary rashes and ulcers	18 to 64	33	2·9	21	12	From 18 y. to 30 y., 11; above 30 y., 22.
Tinea						
(a) circinata -	2 to 16	17	1·5	9	8	Only 3 exceeded 12 y.
(b) favosa -	7 y. each	2		1	1	
(c) sycosis -	—	—		—	—	
(d) tonsurans (including kerion)	8 m. to 13 y.	9	1·3	5	4	Only 3 exceeded 7 y.
(e) versicolor -	19 to 39	4		2	2	
Ulcers -	6 to 70	53	4·7	26	27	40 were 30 y. and upwards.
Urticaria -	23 to 69	5	—	3	2	
Vaccination rashes ?	—	5	—	5	—	
Varicella -	—	13	1·1	6	7	9 were below 5 y.
Varioloid ? -	3	1	—	—	1	
Xeroderma -	2, 9, 22	3	—	—	3	
Unclassified -	—	8				
	Total,	1133				

A glance over this table will show that it includes examples of all the common, almost all the less common, and one or two of the rare diseases, and in the former classes, in a comparatively short time, sufficient cases pass under review to afford ample opportunity for study and clinical teaching. Among the forms conspicuous by

their absence are, anæsthesia, elephantiasis (e. arabum), molluscum fibrosum (fibroma), rodent ulcer, morphæa (Addison's keloid), sycosis, and a few others, chiefly belonging to trivial or very rare affections. If we look at the order of frequency of the common diseases, as compared with the statistics of 500 cases furnished by Dr. Tilbury Fox (*Journ. of Cut. Med.*, Jan. 1869), we get the following series of *common* diseases, *i.e.*, averaging above $4^{\circ}/_{\circ}$.

	DUBLIN.	LONDON.
	Per cent.	Per cent.
Eczema	18·5	19·
Syphilides	8·3	9·5
Prurigo	8·0	6·1
Scabies	7·6	15·7
Porrigo	7·2	4·7
Impetigo	5·0	—
Lichen	4·5	—
Acne	4·4	3·4
Psoriasis	4·3	5·5

As *less common* diseases, *i.e.*, between 4 and $1^{\circ}/_{\circ}$, we have—

Erythema	3·2	—
Vegetable parasites	2·8	7·0 (excluding
Herpes	2·4	alopecia areata).
Pityriasis	1·8	—
Ecthyma	1·5	—

As examples of the more *rare* diseases we have alopecia areata, ichthyosis, keloid, leucoderma, molluscum sebaceum, pemphigus, purpura, favus, urticaria, and one or two others. Climatic conditions have probably much to do with the relative frequency of skin diseases, and Dr. Damon has shown that some diseases are far more common in Boston than in Europe. For example, the percentage rates of the following diseases, according to him, are, urticaria 7, erythema 5, furunculus 4, and herpes zoster 2.

I shall now take up some of the genera in order, and briefly touch upon any points of special interest.

Acne.—Many of the cases had existed for a long time before coming under treatment. The disease was extremely obstinate, apt to relapse, especially troublesome in lymphatic constitutions, and in one case at least developed itself during the use of iodide of potassium. In certain stages, when there was not much inflammatory

induration, alkaline ointments, conjoined with acidulated bitter tonics internally, proved very useful, and one case of one and a-half years duration on the face and back was cured by this treatment. In the indurated forms it is an excellent plan to pencil each little tubercle once or twice with acid nitrate of mercury by means of a glass rod.   There certainly seems to be some connexion between the occurrence of acne simplex and the advent of puberty.

Alopecia.—Alopecia areata (Tinea decalvans) is excluded from the list of Tineæ, for the observations of Pincus, Rindfleisch, Wyss, and Duhring throw great doubt, if not complete denial, upon its parasitic nature.

Eczema.—The cases that proved least amenable were papular eczema of the face, pruritic eczema of the vulva and pubis, and general eczema of the body.   As examples of cases due to local irritation may be cited one of pustular eczema on the thigh of a shoemaker in the spot where he struck with the hammer, one following on piercing of the ears, and one occurring in an electro-plater on the back of each hand.   In one case of pustular eczema of the face and neck in a woman there was extreme susceptibility to mercury, for, on one occasion, she took two pills of rhubarb and blue pill (about three grs. of pil. hydr. in each), and in a few days the mouth and gums became sore, teeth loose, fœtor and salivation set in, and the other usual symptoms of mercurialization.   She recovered speedily under suitable treatment.

Diagnostically it is not always a simple matter to distinguish eczema from scabies in young children, and care should be taken not to confound it with seborrhœa of the head, a trivial and manageable affection.   It is sufficient to turn up the crusts and to examine them and the surface of the skin.   In one case of chronic eczema of the fingers in a porter, aged sixty-one, four *nails* on the left hand and two on the right were eroded and broken.   Destruction of the *hair* was seen in a case of eczema of the vulva, and in one on the penis and scrotum.   The latter, which had lasted a month, was speedily cured by ung. citr. dil., and the hair soon reappeared.   Three cases of very severe acute purulent eczema were met with; two on the back of the hands and on the arms, and one on the face and neck In one of the former a purulent bulla, tense and hemispherical, the diameter of a billiard ball, occurred; but I allude to them here as showing the value of the bold application of nitrate of silver (dissolved in sp. æther. nitr., ten or fifteen grs. to ʒi.) even when the discharge was free, and considerable irritation was present.   A

complete and rapid cure was obtained in all three cases, after they had lasted a long time and hung back in an obstinate manner. The ethereal solution offers these advantages—(1.) fatty and sebaceous matters being dissolved by the ether, the caustic gets more thoroughly at the diseased surface and forms an *uniform layer* on the skin; whereas a watery solution is, in the presence of greasy substances, broken up into separate drops; (2.) it dries rapidly. This solution is highly to be recommended, but should be made in small quantity and preserved from the light, as it is very prone to decomposition. Similarly, ethereal tincture of iodine has been recommended. When, as often happens, the discharge is fœtid and offensive, great benefit follows a linseed or carrot poultice well moistened with solution of permanganate of potassium. In obstinate chronic local eczema the careful use of mercurial preparations, especially white precipitate ointment, is often remarkably successful, and fully deserves the praise accorded to it by Niemeyer. By this means I have had cures effected in three weeks in a case which had lasted for a year on the face; and in a fortnight in the case of an adult with eczema of the face for two years. With young children it is better to dilute it with zinc ointment, and in all cases the diseased parts must be kept thoroughly and *constantly* covered with the ointment. In very old cases with induration, soft soap solution (equal parts of soft soap, oil of cade, and methylated spirit) a modification of " Hebra's tincture," will sometimes clear away the disease, after other tarry preparations, *e.g.*, carbolic ointment, have failed. An irritable skin will resent soap tincture, but may bear a lotion of equal parts of lead lotion and carbolic acid lotion with a little glycerine; an extremely useful application in some cases. The uses of arsenic, cod-liver oil, &c., internally are purposely passed over, simply calling attention to the necessity, especially in old and relapsing cases, of combining local and general treatment.

Erythema nodosum.—In at least six cases the eruption appeared, though less abundantly, on the arms as well as on the legs, but in no case were the arms exclusively affected. In several there was marked constitutional disturbance, and in one case, a woman, aged thirty, the eruption had existed for three weeks before I saw her. No evidence could be obtained in confirmation of Mr. Hutchinson's suggestion as to its alliance with the exanthems, for neither were there any traces of its apparent contagion or of its simultaneous occurrence in several members of the same family, nor was there any indication of its showing itself occasionally as an " abortive

exanthem." In one case only was there any probable account of its previous occurrence eleven years ago. In some there was sweating, but no other concomitants of rheumatism, and in none was the heart affected.

Erythema papulatum.—Came on during lactation in one case, and appeared on the face, neck, chest, and legs. In two cases it recurred, and in one case was attended with febrile symptoms. In the two cases of copaiba rash the eruption did not appear until the medicine had been taken for six or seven days, and, in one, temporarily reappeared on the hands.

Herpes.—Of symptomatic herpes several cases occurred with the eruption disposed exactly symmetrically to the middle line of the chin or lip; two cases of h. pudendalis were observed, and one of h. circinatus on the cheek with three concentric zones. In a young girl it appeared on the cheek during convalescence from a troublesome attack of pemphigus.

H. zoster.—The eruption was observed at one time or another in the track of most of the nerves, from the side of the neck to the groin and upper part of the thigh; more commonly within the limits of the upper six dorsal nerves. In several instances the eruption transgressed the middle line of the back, and occasionally so anteriorly. Cicatrices of old attacks were seen in two or three cases not included in the table, and the scars were partially anæsthetic.

Mr. Hutchinson has drawn attention to the curious coincidence of the occurrence of h. zoster during, or soon after, the patient was taking arsenic, and has recorded fifteen illustrative cases. I have seen one such in a man who had been taking arsenic for some weeks for an obstinate attack of psoriasis gyrata. A herpetic rash appeared on the left side of the neck, behind the angle of the lower jaw, and gradually extended by successive patches over the posterior inferior triangle towards the sternum, and behind the shoulder near the acromion. To his knowledge he had never had a similar eruption before, and after continuing for some time it retrograded to the papular stage, and the patch gradually assumed the distinctive *characters of psoriasis.*

As far as treatment goes the best application is undoubtedly flexible collodion, which effectually excludes the air and preserves the vesicles from irritation and the consequent risk of ulceration. If the vesicles be large and angry "styptic colloid" is perhaps preferable, or Pavesi's collodion (collodion 100 parts, carbolic acid 10, pure tannin 5, benzoic acid 3).

Hydroa.—The diagnosis in this single case was provisional, and the question lay between hydroa and erythema papulatum, a closely allied affection indeed. It nearly approached Trousseau's description of erythema papulatum in the gravity and duration of the constitutional disturbance, but the case cannot, for want of room, be cited here.

Impetigo.—Contrary to the opinion of some I believe that impetigo represents a perfectly definite genus of disease, and one, moreover, which is easily curable by cleanliness, and any mildly stimulating ointment. Like some other pustular affections the discharge may give rise to an eruption similar to itself if accidentally brought into contact with healthy skin.

The so-called "contagious impetigo," so well described by Dr. T. Fox, deserves a simple term for itself on account of its plainly marked characters, and Mr. Hutchinson's proposal to restrict the word "porrigo" to this disease meets the difficulty. (See *Porrigo*.)

Lichen.—Six cases of l. circumscriptus were observed, all on the neck, with the exception of one on the cheek. Five cases of l. urticatus, one in a female, aged twenty-two, coming out after sea bathing. Two cases of l. planus, one on the neck, and the other on the arm and thigh; both in females. L. pilaris and l. lividus were also noticed. As a curious error in diagnosis I have known a copious eruption of lichen mistaken for scarlatina.

Bran or alkaline baths are both acceptable and serviceable in the treatment of chronic lichen; and in two cases of local lichen, one of two and a-half years duration in an adult, and the other one and a-half years in a child, a complete cure was effected under the use of diluted red precipitate ointment.

Lupus.—There is no specific distinction between l. exedens and l. non-exedens and the two forms not unfrequently co-exist. In the non-ulcerating stage difficulty has arisen in distinguishing it from a syphilitic eruption. Carbolic acid (liquefied) is a good caustic for the superficial forms of lupus, and, to penetrate more deeply, an aqueous solution of chromic acid (1 to 8 or 12) is a manageable and not very painful escharotic.

Pemphigus.—Several interesting cases of this peculiar disease were met with, but I can only allude in passing to the very characteristic, loose, papery scales of p. foliaceus, to the severe prostration attending on chronic pemphigus, and to the use of arsenic in the treatment of it. A remarkable case occurred in a young girl, aged eighteen. She was seriously ill with pemphigus on the legs when

she was attacked with scarlatina. To this succeeded purpura hemorrhagica, and for days she lay in a miserable condition; the bed clothes saturated with blood, and constant bleeding going on from the nose, mouth, bladder, uterus, and lower extremities. Her legs literally dripped blood, and yet, in spite of all these ailments, she made a capital recovery, and was restored to good health. A well marked case of the rare form, p. gangrenosus, occurred in a little girl, aged four.

Pityriasis.—A remarkable case of that extremely rare disease, p. rubra (dermatitis of Wilks) affecting the entire body came under notice, but it has been already reported in the *Dubl. Quart. Journ.*, May, 1870. A man, aged thirty-five, exhibited a good example of p. pilaris on the legs and arms, to which Dr. Fagge has lately called attention under the name of "rhinoderma."

Many cases of pityriasis of the face were observed, and in some it was difficult to draw the line of distinction from erythema and chronic eczema.

Porrigo.—This "contagious, common, and curable" disease (Hutchinson) deserves a more extended recognition than it seems to have gained, and is seen to form $7°/o$ of the whole number of cases. It is easily cured by cleanliness and white precipitate ointment, to which carbolic ointment may be added with advantage, and when co-existent with eczema it may be observed that the porrigo will be cured first, leaving the eczema still behind it. The appearance of the circular thick crusts formed by the free sero-purulent effusion is highly characteristic, and though almost invariably associated with abundant pediculi, it is a question whether the eruption be wholly due to them.

Prurigo.—It was not considered worth while to separate pruritus from it, for there were very few cases, certainly not more than ten, mostly in males, in which no skin-lesion could be detected. Moreover the two terms are often loosely applied, and even where the pruritus appears as the primary affection secondary skin-lesions usually appear sooner or later. Though pediculi have undoubtedly a large share in provoking and keeping up the disease, I still think there are not a few cases to which the doctrine of "pedicularia" by no means applies. But, in the pedicular cases, it is certainly surprising how rapid a cure, in old standing cases, can be obtained by careful anti-pedicular treatment, and foremost amongst these stands the destruction of the vermin by baking the clothes.

Psoriasis.—Although, of course, some cases proved very rebellious

to treatment, others, of a severe form and protracted duration, yielded most satisfactory results. A girl who was covered from head to foot with dense mortar-like scales for two years was nearly completely freed from the eruption in six weeks by wet packing, arsenic internally, and the local application of carbolic ointment first, and afterwards, soft soap tincture (see eczema). Other cases, of two years and three years duration were cured in from two weeks to two months respectively by a similar line of treatment. Even the worst cases are capable of great relief, though, unfortunately, we have no means of preventing relapses. Psoriasis may be limited to one arm only, or even to the glans penis. The patches of diffuse psoriasis are sometimes partially anæsthetic.

Scabies.—Several very severe purulent cases occurred on the feet of children, and I have known such a case, with small bullæ, diagnosed as pemphigus. When the skin is irritable or much broken, sulphur ointment cannot be thought of, and then lead lotion with tincture of benzoin, or a mixture of carbolic and lead lotion is a suitable application, and effects a speedy cure.

Syphilida.—In common with the experience of most men the value of iodide of potassium in late venereal affections was abundantly shown, and a case of rupia of the thigh, of sixteen years standing, healed in a month under its influence.

Tinea circinata.—In one case was associated with tinea tonsurans in another member of the family, and in a second with the pustular form.—(Kerion.)

T. favosa.—In one case I inoculated my arm with a portion of crust from a favus head, in which the disease had been microscopically verified. In about eighteen days a small raised circular red patch was noticed at the seat of inoculation, with a few yellowish scales. Three days later there were visible three minute sulphur-yellow specks, attended with slight itching, which gradually increased, and in a few days the red patch was considerably enlarged and covered with a moist, easily detached, yellowish film. Under the microscope numerous *large* spores, and a closely interlaced mycelium were seen. The crust was then removed, and the spot cured by local treatment; a tendency to scaling remained for some days. Dr. Purser also kindly examined the crust, and found the fungus elements to consist chiefly of branched filaments, with club-shaped and beaded extremities, with some oval spores. My friend, Mr. C. Ball, submitted his arm to inoculation from the crust on mine, and in a week a small red patch appeared with one minute dry yellowish spot.

T. tonsurans.—In a family named White five members were successively attacked, four with T. circinata, and one with T. tonsurans, and shortly after the nurse of the younger children contracted T. circinata on the left forearm, in a spot where the child's head, affected with tinea, used to rest.

I need scarcely observe that the separate enumeration of the varieties of tinea is not meant to imply a belief in the non-identity of their fungi; and the very interesting case recorded by Dr. Purser, in which tinea circinata in the human being was caused by transmission *from favus on a cat*, tends to confirm the opinion as to the unity of the fungi concerned in all the vegetable parasitic diseases.

A curious lotion was used by the mother of a child suffering from ring-worm of the scalp, viz., a mixture of urine and sulphur.

T. versicolor.—Failed in an attempt at inoculation. When but slightly developed it is probably frequently overlooked, and is often discovered accidentally on examining a patient for some other purpose. Corrosive sublimate lotion (grs. i.—ii. to ʒi.) cures it rapidly.

ART. XV.—*Essay on Personal Identity, and its Proof from Physical Signs.* By ROBERT TRAVERS, A.M., M.B., of Trinity College, Dublin; Fellow of the King and Queen's College of Physicians; College Professor of Medical Jurisprudence in the School of Physic, University of Dublin; Lecturer on Forensic Medicine and Hygiene in the Ledwich School of Surgery, Peter-street, Dublin.

QUESTIONS of doubtful or disputed personal identity have so often arisen, in various forms, before the judicial tribunals of many, if not all, civilized nations, and have been so difficult of solution, that they become subjects of great interest to the investigation of the student. They have not been disregarded by authors—Fodere and Orfila in France, Beck in the United States of North America, and the late Dr. W. F. Montgomery in this city. having each contributed to our knowledge of personal identification, by writings which may justly be regarded as our classical authorities in this part of legal medicine. It would be vainly presumptuous to aim at rivalling them, and therefore what is proposed in the present pages is, after a rapid view of the subject, to adduce some particulars of what may be termed " leading cases," exemplifying the difficulty necessarily incidental to such inquiries, and which may

urge the reader to seek further and more satisfactory information from the excellent authors that have been just now enumerated.

The subject in its entire extent may be referred to these two questions—

1. What is personal identity?

2. By what evidences is personal identity to be either ascertained or disproved?

Those who have not as yet considered the matter, will perhaps think that these questions might easily be answered; but if they reflect, and with the requisite attention endeavour to reply, they will be convinced that the task is indeed one of very great, if not insuperable difficulty.

I. *Personal Identity.*—This, in the medico-legal sense which is here to be considered, is entirely divested of its relations to theology, and to metaphysical or psychological philosophy. This restriction is necessary in determining the value and application of the term, the identity of a living, organized body, at different points of time, being something very different from the persistence or the coincidence of a geometric quantity or figure. The figure may be literally and exactly the same unaltered object; but the living body is the seat of continual changes; processes of absorption, assimilation, reparation of waste, metamorphosis of tissues, rejection of effete matter, are continually in progress, and are essential to its mundane existence, so that, to some extent, its identity at successive and distant points of time may be compared to that of the Panathenaic ship, to which, in the course of ages, from frequent repair of decayed portions and the substitution of new, there remained little, if anything, of the original material. Hence, when the personal identity of man is mentioned, the sameness is meant that is compatible with this life and the conditions to which vitality is subject. A continued consciousness has been proposed as necessary to personal identity; but would it be said that the identity was lost if the memory had become altogether extinct, and the continued consciousness no longer existed? Considerable portions of the body may be destroyed by disease or accident, yet the identity remains—that is, in the sense in which the word is here used, and it is not affected by the amputation or avulsion of a limb, or of all the limbs, so long as the consciousness endures. The horse-tail argument might be here used, and only this result be obtained, that personal identity may be predicated of consciousness united with life in any demembered or mutilated human body.

The continuance of consciousness was attributed by the older writers of fiction to those whom they fabled to have undergone change of form. Thus Ovid, Lucian, and Apuleius represent their metamorphosed subjects as retaining, in their new forms, the memories and consciousness of their former state. The Pythagorean belief in the transmigration of souls into various bodies, not only human, but of the lower animals, has been made to support a claim to a consciousness continued from previous states of existence ; and among the delusions of the present time it is memorable that some persons have been found who asserted their own consciousness of a state of pre-existence. One at least of those who, in our days, has so far imitated Pythagoras, published several letters on the subject in the well-known literary periodical, *Notes and Queries*, wherein the curious may readily refer to them. This imagining of a continuing consciousness of a former bodily existence, if it has not its original, has at least its best known author in the philosopher Pythagoras, of whom it is asserted that he had a consciousness not only of a previous existence as that Euphorbus who was slain by Menelaus in the Trojan war, but also of the various bodies with which he had been successively identified in the interval between the siege of Troy and his birth as the son of Mnesarchus. It is probable that he learned this doctrine of the metempsychosis from the Egyptians, and that its original is concealed in ages long preceding the time of Pythagoras himself.

The belief in a metempsychosis is still very extensively diffused through heathen nations, and is closely connected with, if it have not given origin to many strange opinions respecting the human soul, and a capacity attributed to it of becoming separate from the body and entering at will into some other. Hence the story of the King of Tarentum, which Morisot, or whoever else was author of the Fifth Part, added to the Euphormio (more than two centuries back), and which, with a few alterations, was adopted in the present century by Caunter, in the *Oriental Annual*, without any acknowledgment of obligation to a preceding author, or a common original to which both might have been indebted. Fantastic, or at least unproved, as this opinion is of the soul becoming separate from the yet living body, it has not long since been adduced by a criminal as a defence equal to that of mistaken identity, or an *alibi*. George W. Winnemore, who, having been convicted of murder, was hanged at Philadelphia, U. S., North America, 29th August, 1867, had associated with people called spiritualists and clairvoyants, and

affirmed that, under their influence, his spirit, separated from his body, used to be sent on errands many miles distant, and that meanwhile some other spirit was sent into his body, which was thus made the instrument of a murder, at which he was himself surprised, when returning to resume his own corporeal habit, he found the instrument of murder in his hand, and lying near him the victim who had been murdered, while, as he alleged, his spirit was employed at a place sixty miles distant, to which it had gone and had returned within one hour. This spiritualist story, which, if true, would have established a mistaken identity in favour of the accused, was not even admitted as supplying proof of an extenuating circumstance.

The *Vampyre* of Eastern Europe, a human corpse temporarily animated by an evil spirit, is probably another offspring of the Pythagorean metempsychosis, and would be inconsistent with personal identity.

The mediæval *Lycanthrope*, which is not yet wholly extinct, if travellers' tales are to be credited, was either referrible to insane delusion in its subject, or to the popular opinion that had somehow originated in the Pythagorean transmigration of spirits.

As the identity of person is not destroyed by the loss of considerable portions of the body, all the limbs, and even more being removed, and yet neither life nor consciousness being extinguished, so also it is admitted to remain notwithstanding the most complete insane delusion. In some cases it is even probable that a double consciousness may exist—a true and a delusive, not successive or alternating, but contemporaneously existent, like parallels rather than productions of the same line. In such cases are there two identities, explicable by the duality of organs within the skull?

II. *Evidences of Personal Identity.*—These might conveniently be classified into—(1) Those observable only in the living; (2) Those observable, though in very different degree, in both the living and the dead; (3) Those which are only detectible in anatomical examination of the dead. To one or other of these divisions may be referred what are here subjoined.

(*a*) The face in its features and expression furnishes the most obvious means for recognition or identification of the person. And so the robber who was inextricably ensnared in the treasure-house of Rhampsinitus (ap. Herod. *Euterpe*, 121) judiciously frustrated identification, when he caused his head to be cut off and carried away by his comrade in the adventure.

A protracted absence from view, together with the changes which advancing years and perhaps other concurring causes have wrought in the frame, may be sufficient to impede or prevent recognition even by those to whom the subject had formerly been well known. After an absence of about fifteen years Joseph was not recognized by his brethren (*Genesis*, xlii. 8), although he was able to recognize them (*ib.*). Ulysses returning home in the twentieth year of his absence is represented as having much difficulty in making himself known to his father, to his wife, and to his dependents (*Odyss.*, xix., xxiii., xxiv.). The identity of the Portuguese king, Sebastian, claiming recognition twenty years after he was believed to have been slain in battle was not satisfactorily established, nor was it sufficiently disproved. It remains a subject for historical controversy. That of the Bolognese noble, Andrea de la Casa, returning home after a still longer period of absence was only with difficulty admitted, the features having been so altered by years, exposure to various atmospheric conditions during foreign travel, and protracted hardships of many sorts, that recognition, based on the countenance, was no longer possible. But other physical characters were available " plura evidentissima signa," and were determined to be sufficient when this difficult and obscure case was investigated by the justly celebrated Paul Zacchias, chief physician of the Sovereign Pontiff, Innocent the Tenth.

The value of the countenance as a character of personal identity is somewhat impaired by the close facial resemblance which is sometimes seen to exist between two persons, and which, if it be co-existent with a similarity of stature and figure, renders them undistinguishable by sight alone. This similitude has been exhibited by twins, but is not limited to them, having been also observed in persons who were not of kindred with each other. The embarrassment which in real life has been caused by this personal likeness has suggested its employment by the dramatic poet, a circumstance to which we are indebted for the *Menaechmi* of Plautus, and Shakespeare's *Comedy of Errors*.

Similarity of features has been relied on as a proof of blood relationship or agnation, a remarkable instance being the Douglas cause, in which this family likeness was urged on behalf of the claimant, and probably contributed in some measure to the definitive decision pronounced in his favour by the House of Lords of Great Britain in the year 1769. The successful claimant survived

till 1828. The hereditary transmission of a peculiar facial confor-
mation has through many centuries been remarked in the princes
of the House of Austria.

The effect of the loss of teeth, whether by injuries, disease, or
old age, must be considered in the examination of the face,
especially if the living features are to be compared with photo-
graphic or other portraits taken long previously. The profile
outline is much altered by complete removal of the teeth. Diseases
of the jaw bones, such as necrosis, and some of the malignant type,
must also be regarded as among the causes capable of altering the
look and expression of the face. In the dead body, recognition
from the aspect becomes more and more difficult, until it is ren-
dered impracticable by advancing putrefactive changes. Dr.
Richardson, of London, in 1863, successfully encountered this
difficulty in a corpse already swollen and discoloured, found in the
river Thames. Its identification was anxiously sought, and was so
far effected by Dr. Richardson's ingenious process of immersion in
a chlorinated bath, that it become possible to determine certainly
that it was not the body it had been suspected to be. In deaths
caused by explosion or burning, the destruction of the soft parts
may be such as to prevent identification. Even the skeleton may
be disintegrated by fire, as in the horrible catastrophe at Abergele,
where many fragments were found that could not be referred to
either sex much less to any particular person of those who perished.

(*b*) The voice may serve to identify the person not seen, or to
discriminate when there is similitude of features and figure. Thus
the patriarch Isaac in his old age, when no longer able to see,
recognized the different voices of his sons, but was yet deceived
because he relied on what he thought the more certain testimony,
the concurring evidence of two senses, those of touch and smell
(*Genesis* xxvii. 21–27).

It must not be forgotten that the voice is liable to be altered by
disease of the fauces, nares, larynx, and other parts subservient to
respiration; that it may even be suppressed altogether by the
pressure of an intra-thoracic tumour, or one of the thyroid body;
and that some wounds of the throat, especially those which divide
the recurrent or laryngeal nerves, may destroy, or enfeeble, or
heighten the voice.

(*c*) Congenital peculiarities, such as deficiency or redundancy of
parts, arrested development, naevi materni, moles, intra-uterine
amputation of limbs, blindness, deafness, dumbness, cyanosis.

Thus the indications that supernumerary fingers or toes existed have been detected long after death in the skeleton, although the phalanges themselves were not found either *in situ* or intermixed with the surrounding earth.

Naevi materni are good, because permanent marks, but do not necessarily identify the person. Their approximation to such proof will be in proportion to their number, especially if grouped. Thus the occurrence of three near each other will be of more value as a character than that of a single one, or of a pair. Three seated on the scalp, not a usual situation, have been observed in one instance out of a large number of cases in which particular attention was directed to the number and position of these marks. The significance of these congenital marks, as means of identifying the person, has not escaped the notice of poetry. Hence Spenser did not err against probability when he described the recognition, from a naevus on the breast, of his Pastorel, by

> —— " her own handmaid, that Melissa hight,
> Appointed to attend her duely day and night,
>   Who in a morning when this maiden fair
>   Was dighting her, having her snowy breast
>   As yet not laced, nor her golden hair
>   Into their comely tresses duely drest,
>   Chaunc't to espy *upon her ivory chest*
>   *The rosy mark*, which she remembered well
>   That little infant had, which forth she kest,
>   The daughter of her Lady Claribel,
> The which she bore, the whiles in prison she did dwell."
>
> *Faëric Qu. VI.*, xii., 14, 15.

But those who, in the Greek and Roman times, cruelly abandoned helpless infants, by exposing them in places where they might be found and come under the precarious guardianship of the finder, did not rely exclusively on naevi or other physical signs for the means of future recognition. It was customary to deposit along with the exposed infants, or appended to them, certain objects, such as ornaments, jewels, toys, or articles of clothing, which should serve as tokens or proofs of the child's identity at any subsequent period when it might be claimed for recognition. These objects were preserved with care, being reposited in caskets which it was usual to place within a satchel, or a wicker case covered with leather, just as the early Irish Christians enclosed a sacred

book or a relic in its *cumhdach.* The Greeks termed these objects
γνωρίσματα, σπάργανα, or ἐπισήματα ; the Romans called them
crepundia, and sometimes *monumenta.* The practice of preserving
them, and the identification which was thus facilitated in later life,
is frequently introduced by the dramatists, and ancient writers of
fictitious histories. Plautus, in his *Cistellaria,* and again in his
Rudens, makes the losing or the finding of these *crepundia* con-
tribute to or produce the event in each drama. Terence makes
Sostrata, describing the abandonment of her infant daughter, relate
the precaution she took of having a ring from her own finger
deposited with the exposed child—

> —— " quum exponendam do illi, de digito annulum
> Detraho ; et eum dico ut una cum puella exponeret."
> —*Heaut.* IV., i., 37, 38.

And in another of his dramas, Thais commands her maid-servant
Pythias to fetch the casket containing the tokens—

> " Abi tu, cistellam Pythias domo effer cum monumentis."
> —*Eun.* IV., vi., 16.

Heliodorus, in his Theagenes and Chariclea, attributes a similar
importance to such deposited tokens as aids to subsequent identifi-
cation. An, at least, equal significance is given to them by the
sophist Longus, in his Poemenics. And to both classes of evidence
for such identification—the physical signs on the person, and the
added tokens—Cicero refers when he says (*De Claris Oratoribus,*
xci.), " Totum me, non naevo aliquo, ant crepundiis, sed corpore
omni videris velle cognoscere."

(*d*) Deformities resulting from injuries, as fractures, mutilations,
or from disease. Thus lameness from shortening of the limb may
result from disease of the acetabulum, or of the great trochanter ; of
the knee-joint, or ankle-joint ; or from various fractures, as the
intracapsular, and others which will readily present themselves to
the student's recollection. The magian Smerdis, who personated
the royal Smerdis, and occupied his place for several months, was
detected immediately when it was discovered that his ears had been
cut off, and that not recently (Herod. *Thalia,* 69). It is obvious
that, if the true Smerdis had suffered a similar mutilation, the
imposture might have escaped detection. Attention should be
directed to ascertaining at what time and by what means any de-
formity, not congenital, had been caused. Even slight deformities

may serve as good diagnostic characters. Professor Alfred Taylor describes a case of suspected infanticide, in which the body was identified by a prominence of the tendon of the tibialis anticus, on the instep (*Med. Jurispr.*, chap. xlii.). In the case of a murdered man, who had been lame from birth, and whose body had been dismembered for the purpose of concealment, MM. Breschet and Dupuytren identified the remains by determining the existence in the skeleton of the congenital malformations on which the lameness depended (1 Orfila, *Med. Leg.*, 84).

(*e*) Cicatrices of wounds, as well of injuries as of surgical operations, and of strumous, syphilitic, or other ulceration.

Variolous foveolæ, and the permanent traces of successful vaccination.

Tattooing, which is sometimes executed with several colours and much skill in the designed pattern. Whether it be effected by introducing the carbonaceous, or other colouring matter, into slight incisions, or into numerous contiguous punctures, it is equally incapable of being obliterated. It is not unusual among sea-faring men, who have adopted it probably from the New Zealanders and Polynesians, with whom it is a national characteristic.

All these are marks as persistent, and, if their age be known, as valuable as the congenital naevi.

Cicatrices are permanent evidences of lesions, and usually present characters from which may be inferred the nature and extent of the original injury, and sometimes, though but rarely, the period of time at which it was suffered. A clean incised wound which has been healed by the first intention leaves an almost imperceptible linear scar, which, in some situations, might easily be confounded with the natural striæ of the cuticle. The cicatrix of venesection at the bend of the arm becomes, in the course of time, very difficult to observe. But the cicatrices of contused and lacerated wounds are irregular in outline, and are often uneven or even tuberculated in surface, so as to constitute actual deformities. The cicatrices of burns, and those resulting from the punishment of flogging, exhibit those appearances in the most marked form. All cicatrices are somewhat less in extent than the injury that they follow; they have a tendency to continue contracting, gradually lose the vascularity of their earliest period, become more and more indurated, and, though covered only by a smooth, closely adherent epidermis, different from the cuticle, but scarcely distinguishable from it in colour, have very little sensibility. In some morbid states, as in

that of the sea scurvy, those newly-formed tissues have been observed to yield, and the wounds to which they belonged to re-open.

Punctured wounds, gunshot wounds, and some that result from caustic applications, leave a sensibly depressed cicatrix. This has been observed long after the use of hydrochloric acid in treating wounds inflicted by a rabid animal.

The hero of the *Odyssey* had in youth received a deep and extensive wound of the thigh while hunting the wild boar; the cicatrix was therefore properly made to aid in his recognition perhaps forty years afterwards (*Odyss*. xix. 391, sq.). But the recognition is not made to depend on this alone; it is accompanied by several corroborating circumstances.

In the French case of Noiseu, quoted by Beck from Fodere, the evidence of cicatrices was disregarded.

After cicatrices have been completely formed, and have lost the vascularity of their first period, which may last several weeks or even months, they appear to undergo no change, unless a very slow and almost imperceptible contraction and induration. Hence the determination of their age after the first year has passed is scarcely to be expected. The shape of the cicatrix often differs from that of the wound, being modified by the figure and motions of the subjacent parts, and the condition of the areolar tissue.

The importance of cicatrices as diagnostic marks in personal identification was exemplified in the case of Smyth *v.* Smyth, tried at Gloucester in August, 1853, when the traces of scrofulous ulcers on the neck and right hand of the plaintiff served to identify him as one Provis, a convicted felon, in no way connected with the family to whose title of honour and estates he had made claim.

(*f*) Age, sex, growth, development, and decay each furnish physical characters that may be used in discrimination and identification. But sex itself has been successfully concealed, and in some recorded instances, one of which has very recently become known in this country, has not been discovered until after the death of the subject had given occasion to an inquiry. This case was that of a female who had disguised herself in male attire. But while this sheet was at press, the public journals announce the discovery, in the county Limerick, of a male, who for ten years past had been unsuspectedly disguised in the apparel of a female. The scholar will call to mind the story of Achilles, so effectually concealed by the female dress that he was only discovered by an artifice.

The teeth and hair may each be subservient to identification; but it must be remembered that both are easily liable to sophistication, the natural teeth being replaced by artificial substitutes, and the hair being changed from its own colour to some other by various dyes in which lead, copper, and mercury are not infrequent ingredients. The identification of some fragments of osseous remains, as those of George Parkman, M.D., who was murdered in Boston, Massachusetts, in November, 1849, was chiefly established by the adherence of some recognized artificial teeth to a fragment of the upper jaw. In a case of murder investigated in France, the hair of an adult female was identified, in the *debris* of the body and the earth in which it had been buried, eleven years after the interment (1 Orfila, *Med. Leg.*, 92).

The characters of age appear to have been unnoticed in the case of Babilot and Baronet, in which a man, aged thirty-four years, was fraudulently substituted for one of forty-eight, although there were also physical signs sufficiently remarkable to distinguish their respective possessors. Both men had been above twenty years absent from their native place, and this, together with the combination in the fraud of the sister of the elder, and the father of the younger, rendered it possible. The case was decided in the bailliage court of Rheims, which condemned Baronet, the elder man, as an impostor, sentencing him to be a galley-slave for life. After two years Baronet found means to appeal to the Parliament of Paris, by which, after examination made by the celebrated surgeon Louis, the sentence of the bailliage court was annulled, and the appellant's identity recognized, with restitution to all his rights (26 *Causes Celebres*, 256).

(*g*) The effects of trades and other employments, and of habits of life, customs, and manners, are often so far impressed on the bodily conformation that they may become auxiliaries of no small importance in cases of contested personal identity. Thus a peculiar attrition of the teeth in an inveterate tobacco smoker, resulting in the formation of two semicircular depressions, one in the upper the other in the lower jaw, vertical to each other, so as to exactly compress the pipe, was among the means of identifying the remains of Nicholas Joseph Guerin, who had been murdered by his brother (1 Orfila, *Med. Leg.*, 86). In this case there was also congenital lameness.

The most ancient attempt at the identification of osseous remains and the connexion of their state with habits of life, is that recorded

by Herodotus (*Thalia* 12), who tells us that on the battle field of Pelusium, where Psammenitus had been defeated by Cambyses, it was still possible to distinguish the nationality of the slain by the differing condition or consistence of the Persian and Egyptian skulls.

Of all these physical signs it may be remarked, that they are divisible into such as may and such as cannot be simulated. Their probative and diagnostic value also is varied according as they are applied to establish an affirmative or a negative; for the presence of one or more of the physical signs above mentioned cannot prove the affirmative with the same certainty that their absence would prove the negative. If Titius had been treated successfully by incision for strangulated hernia, or had been punctured above the pubis for retention of urine, and that Caius, who resembles him in appearance, attempts to personate him, and on examination is found to have no trace of such operation, there will be in this absence of physical signs, positive evidence of diversity, and consequently of imposture. On the contrary, should the cicatrices of such operations be discovered on Caius, they would be insufficient to prove the identity that he had claimed. It would still be dubious, and other means would have to be adopted for ascertaining the true relative positions of the parties in the contestation. John Doe, who is pock-marked, may succeed in personating Richard Roe, who had emigrated twenty years previously, and was not known either to have been vaccinated or to have had small-pox. But Peter Styles, who had been successfully vaccinated during childhood, and had subsequently gone abroad, and thenceforward remained entirely obscured from the knowledge of his family, could not be personated with success by John Noaks, who, resembling him exactly in face and figure. yet had neither the mark of vaccination nor any other cicatrix occupying its site. The absence of this sign would be absolutely inconsistent with demandant's case, unless the arm in which it ought to have been found had been amputated, or had been the seat of ulceration, or had suffered injuries by which the vaccine cicatrix, if present, might have been destroyed. The significance and value of physical signs will be therefore affected by the possibility of their having been imitated, or acquired for the purpose of deception.

Although neither personal resemblance nor any other physical sign is to be admitted as an indubitable evidence of identity, the concurrence of others with it will, in the absence of positive

contradictory testimony, obviate the objection to which each singly might be liable. The author of the *Odyssey* must have been aware of this when he made his hero, returning home in the twentieth year of his absence, establish his identity, not only by the well-marked character of the great cicatrix on the thigh (*Odyss.* xix. 391, sq.), but also by his recollection of long past private incidents (*ib.* xxiii. 110–206, cf. xxiv. 321, sq.), and in addition by his being recognized, even at that distance of time, by his aged and faithful dog Argus (*ib.* xvii. 302).

The investigation of personal identity is required in a great variety of cases. (1) The plea of " mistaken identity " is very frequent as a defence against charges of criminality, but is often resolved into one of " alibi." (2) In cases where " personation " is alleged, the question of identity is necessarily raised, but it is rarely, if ever, found that the matter cannot be decided by other evidences than would be deducible from a laborious examination of physical signs, more or less obvious. (3) Where " supposititious children " are suspected to have been introduced, or attempted to be introduced, into a family, the identity, together with the maternity, and, perhaps, also the indications of recent parturition, require to be strictly scrutinized on behalf of those who would be injuriously affected by such a scheme. There are many recorded instances of such fraudful impostures having nearly proved successful. (4) Where it is sought to recognize children who have been exposed during infancy, or consigned to a foundling hospital by their parents. The selfish and sophistical Rousseau unblushingly relates the trouble he himself had in recovering his own progeny from the foundling establishment to which he had abandoned it. (5) The most difficult cases, and perhaps therefore the most interesting, are those of persons who, after many years' absence, find, on their return home, that they are no longer recognizable by their household or familiars; or they may have survived all to whom they were personally known; or the long absent traveller having perished in some unknown catastrophe, or being supposed to have perished, his place in society may be claimed by an adventurous impostor who has managed to obtain just so much knowledge of the lost person's affairs as may suffice for persuading the ignorant, the unsuspicious, and the unreasoning, who together comprise perhaps a numerical majority of mankind.

The case of Andrea de la Casa, who, returning home after more than thirty years' absence in foreign warfare and slavery, found

himself unknown and unrecognizable, and who was thrown into prison as an impostor, would have been recorded as an attempted and detected fraud, if it were not for the skill and discrimination with which Paul Zacchias investigated all the less obvious though important physical signs, which led to a decision in the aged warrior's favour.

The late Lord St. Leonards says, " Constant claims are set up to the estates of other men by poor and ignorant, and sometimes by crafty persons, although generally the latter support the claims of the former where they think they can work upon the credulity of mankind.   Some remarkable instances of fraudulent claims which have happened in recent times will recur to your memory. I call your recollection to them in order to guard you against such frauds ; for these claims, when specious ones, are made the subject of bargains and wagers in the city, and the claimants held up as persons who have been stripped of their rights by the wealthy, and are deserving of public sympathy.   I have myself seen an office open for a considerable period in a great thoroughfare in the immediate vicinity of Westminster Hall, for the sale of shares in an estate claimed by a person who, to meet the expenses of law proceedings, was willing to allow subscribers to participate *largely* in the profits of the estate when acquired.   Great numbers of persons were cheated by this scheme, which was clearly an illegal one " (*Property Law*, Letter xxiii.).

In such cases it may happen that the result will depend principally on the means by which it may be determined that a demandant is really the person that he professes and claims to be.   The means of proof will then come to be considered under two distinct heads— one comprising the physical signs and their due estimation, the other, which may be the more extensive, the evidences of every other kind by which the inferences deduced from physical characters may be supplemented or corrected.   The first description of evidence is more properly, though not exclusively, the part of medical witnesses ; the second of all credible testimony, whether medical or not.   The object of the present essay is necessarily the former only ; the latter requiring not merely legal knowledge, but legal habits of thought, " the legal mind," as it has been termed, remains the province of the professed lawyer, and is discussed at length by Taylor, Starkie, Phillips, and other writers of legal eminence, whom it would be superfluous to more than name.

It is almost superfluous to allude to the baffling of identification

by the substitution of one person for another. Thus Lady Francis Howard, having to submit to a medical examination, the result of which she was conscious would be against her, persuaded the examiners, by an affected modesty, to allow the examination to be made in a darkened room. In this she managed to substitute an unvitiated female for herself, and thus procured the report that she desired. (1 Howell's *State Trials*.)

In most of the temporarily successful cases of personation mentioned by historians, there has existed a close similitude between the personator and the personated. The false Philip of Macedonia, the false Agrippa, and the false Nero, each exhibited this resemblance to his prototype. Of the false Philip it is said by Florus " vir ultimae sortis Andriscus . . . quia vulgo ex similitudine Philippi, Pseudo-Philippus vocabatur, regiam formam regium nomen, animo quoque regio implevit" (*Epit. Rer. Rom.*, ii. 14). Tacitus remarks of the false Agrippa, "aetate et forma haud dissimili in dominum erat" (*Annal.*, ii. 39), and of the false Nero, " servus e Ponto, sive ut alii tradidere, libertinus ex Italia, citharae et cantus peritus, unde illi, supra similitudinem oris, propior ad fallendum fides" (*Hist.*, ii. 8). The physical character, in this last instance, being corroborated by a similarity in accomplishments and attainments, that must have powerfully aided in supporting the deception. It is doubtful whether the claimant of the Portuguese crown, who represented himself to be King Sebastian returned from captivity, was the person he represented himself to be, or was an impostor of more than ordinary ability. The latter alternative should be admitted, if the reported death of Sebastian in the battle of Alcazar (8th August, 1578) had been placed beyond doubt. But the body alleged to be his, which was shown on the field, was not sufficiently identified; whether it was his may be doubted, as it was wounded, and putrefaction would rapidly proceed in the heated atmosphere of Africa, rendering recognition difficult or impossible (Thuani *Hist. sui temp.*, lxv.). The false Demetrius in Russia, certainly bore a strong resemblance to the prince he personated, and hence his imposture was for a long period attended with success.

All these cases of personation are far surpassed by one that occurred in the south of France about the middle of the sixteenth century, the circumstances of which were so extraordinary that, if they were not attested by the contemporary judicial documents, they might be regarded as transgressing the limits of credibility as

well as of probability. The personal resemblance which existed
between two men who, for several years, were fellow-soldiers and
comrades, being the probable origin of the train of imposture which
the tenacious memory and the crafty astuteness of one of them
carried on with unbroken success until its tragic termination after
a course of three years. Briefly stated the case is this:—At
Artigat, a place in Gascony, there lived a man named Martin
Guerre, whose wife, Bertrande De Rolz, is described as handsome
("*une belle jeune femme*"), and with whom he lived happily ten
years. He then absconded from home, became a soldier, and in
the army formed a familiar acquaintance with Arnauld du Tilh, a
soldier whose personal appearance bore a very close similitude to
his own. During eight years this companionship continued, in
which time Du Tilh learned all the particulars of Guerre's life,
domestic affairs, and relatives. Relying on the possession of all
this information, and on his own resemblance in person to Guerre,
the crafty Du Tilh resolved on personating his comrade, and
having secretly departed, presented himself at Guerre's house as
the long absent fugitive, at last, after eight years, in which he had
no communication with his family, returning home to resume his
former position. It had been thought that he was dead; now his
unexpected re-appearance filled the house with joy. The pre-
tended Guerre was received and recognized by the family and the
neighbours. As Guerre he was accepted by the parents, uncles,
sisters, brothers-in-law, and the wife of the man he personated; and
was in the same manner, at once and without hesitation or objec-
tions, congratulated by the townsfolk and neighbours to whom
Guerre had been known before his departure. Three years passed
merrily away, the family was augmented by two children, and
detection might never have occurred if a conjugal quarrel had not
been caused by a dispute as to the selling of some part of a farm by
the pretended Guerre. Then discrepancies began to be observed,
deficiences in memory and imperfections or inconsistencies in con-
versations about former years were carefully noted, and a suspicion,
which was at first latent, gradually augmented into a confident
belief in some of the Guerre family that the returned soldier was
not the true man. A division in the family resulted; the greater
number persisting in their recognition of the adventurer. In 1559
a process was instituted before the criminal judge at Rieux, and
depositions were taken at great length from a large number of
witnesses to sustain or rebut the charge of fraud and imposture.

The result was the condemnation of the impostor, who persisted in his story that he was the Guerre who had been eight years absent, and from the sentence of the court of Rieux he appealed to the Parliament of Tholouse, the supreme tribunal of the province. That court itself would have been perplexed how to decide, so conflicting were the testimonies, if the true Guerre had not at last appeared on the scene, and being confronted with Du Tilh was in his turn denounced as the impostor. But the deceived members of the family having gradually discerned the truth of the matter, and revoked the testimony they had given in favour of Du Tilh, he was condemned by the Parliament to be hanged, and his body to be afterwards burned. A copy of the sentence is subjoined, as an authentic evidence of an imposture that appears stranger than fiction, and for which even in the French *Causes Celebres* a parallel cannot as yet be found. About forty witnesses deposed in favour of the impostor, and among them, mistaken and deceived, were the nearest relations of the personated man, together with his friends and neighbours. The sentence, dated 12th September, 1560, was executed, and if any doubt could have remained as to its justice, it was removed by the full confession made by the impostor.

> " Arrest, donne au Parlement de Tholose, à l'encontre de Arnauld du Thilh soldat, sur la supposition du nom par luy faicte de Martin Guerre, aussi compaignon, soldat.

" Veu le proces faict par le Juge de Rieux à Arnauld du Tilh, dict Pensette, soy disant Martin Guerre, prisonnier à la conciergerie, appellant du dict Juge, etc. Dict a esté que la Court a mis et met l'appellation du dict du Tilh, et ce dont a esté appellé au neant: Et pour punition et reparation de l'imposture, faulseté, supposition de nom et personne, adultere, rapt, sacrilege, pilage, larrecin et autres cas par le dict du Tilh prisonnier commis, resultans du dict proces, la court l'a condemné a faire amende honorable, au devant l'Eglise du lieu d'Artigat, et illec de genoux en chemise, teste et piedz nudz, ayant la hart au col, et tenant en ses mains une torche de cire ardente, demander pardon à Dieu, au Roy, à Justice, aus ditz Martin Guerre et de Rolz mariéz, et ce faict sera le dict du Tilh, delivré es mains de l'executeur de la haulte Justice qui luy fera faire les tours, par les rues et quarrefours accoustumez du dict lieu d'Artigat, et la hart au col, l'amenera devant la maison du dict Martin Guerre, pour illec en une potence qu'a ces fins, y sera dressée, estre pendu et estranglé, et apres son corps brusle,

Et pour certaines causes et considerations a ce mouvans la court, elle a adjugé et adjuge les biens du dict du Tilh a la fille procrée de ses oeuvres, et de la dicte de Rolz, soubz pretexte de Mariage par luy faulsement pretendu, supposant le nom et personne du dict Martin Guerre, et par ce moyen decevant la dicte de Rolz, extraicts les fraiz de Justice: Et oultre a mis et met hors de proces et instance les dictz Martin Guerre et Bertrande de Rolz, ensemble le dit Pierre Guerre oncle du dit Martin: Et a renvoyé et renvoye iceluy du Tilh au dit Juge de Rieux, pour faire mettre ce present Arrest à execution, selon sa forme et teneur. Prononcé judiciaire-ment, le douziesme jour de Septembre, 1560."

Beck, mentioning this famous imposture, says, " I am unable to say whether physical resemblances were much noticed in this case " (*Med. Jurispr.*, chap. xi.). The contemporary documents show that they were, and that the wife and relatives of Guerre were deceived by the impostor bearing such an exact resemblance to the absent man that the eye could not distinguish between them, while his accurate information on every subject connected with their family was sufficient to dispel doubt if any existed. The imposture was a surprising and well-sustained effort of memory and astuteness, but it could never have succeeded if it had not the solid support of the physical resemblance—" *La grande similitude qui estoit entre luy et le dit Martin.*" The co-existence of this undistinguishable personal likeness, with an extensive knowledge of the family's private affairs, explains the apparent facility with which the four sisters and their husbands, with their parents and uncle, and the wife of Guerre, admitted the impostor, and in supporting his cause were aided subsequently by about forty witnesses of the vicinity. If the sisters had not been undeceived, so that they revoked their first evidence, it is probable that the definitive sentence would have been very different from that which was given by the supreme court.

From what it has, in these pages, been attempted to submit intelligibly to the reader, on the subject of personal identity and the physical signs that may be auxiliary to identification, the following conclusions may be drawn:—

1. That there is no physical sign from which alone the identity of a person may be proved.

2. That an approximation to certainty of proof may be deduced from, and will be in proportion to, the number and value of the physical signs co-existing and observable.

3. That the presence of physical signs is of less value as affirmative, than their absence would be as negative proof.

4. That congenital malformations, and the permanent cicatrices of lesions subsequent to birth, either from injury or disease, are good characters, directly as they are rare, but in an inverse ratio to the frequency of their occurrence.

Transposition of the thoracic viscera, or the traces of such rare operations as the Taliacotian, would be especially valuable.

5. That those which are capable of being imitated or simulated have, or ought to have, a less value as proofs than those which cannot be simulated, or than those that are ineffaceable without leaving evident indications of what had been done for their removal. And consequently, that in a dubious or contested case, the result should be determined, not from a single sign, unless it decisively establish the negative, or even by one class of proof, but by the sum of all the evidences of every kind that are adduced, which are accordant, credible, and not antagonized or neutralized by others of greater value. The case of Du Tilh exemplifies the fallibility of all human testimony; that of De la Casa shows how an accurate observer and judicious reasoner may, by a just appreciation of even obscure evidences and signs, compensate for the absence of more obvious characters, and so restore to a demandant his civil status, and rights of property that otherwise would have been irreparably lost.

ART. XVI.—*Ozokerit, as a Therapeutic Agent.* By HENRY SAMUEL PURDON, M.D., L.R.C.P.; Physician to the Belfast General Hospital, and to the Hospital for Diseases of the Skin.

THE following note is intended to call attention to a substance that is useful in the treatment of certain forms of cutaneous disease—I refer to ozokerit. However, I wish to preface the following remarks by stating that as yet my experiments with it have been limited. I cannot, or indeed do I wish to laud this substance as an infallible specific in the treatment of skin diseases; but in some of my cases the results have been so satisfactory, that it occurred to me it would probably be interesting to publish the following notes. For a supply of ozokerit I am indebted to Messrs. J. C. and J. Field, the great candle manufacturers, of London, who make brilliant candles from this substance.

The reason that (early in present year) I determined to try ozokerit as a local application in cutaneous affections was from having read with interest a good deal regarding this peculiar product of the earth, and knowing that petroleum was useful in treating scabies and some other skin eruptions, employed in the form of ointment and soap, the latter made by Hendrie, and that one high surgical authority, Professor Fayer, of the Bengal Medical College (*Edinburgh Medical Journal*, December, 1869), believes that petroleum is one of the best applications for ulcers, acting as a " stimulant and detergent application, slightly irritating and as useful as carbolic acid," also that napthaline and Wright's solution of coal tar, and various other substances of a similar nature, are all more or less useful, I thought that the ozokerit would probably belong to the same group; at any rate it could do no harm to try it, for which object the dispensary department of the Hospital for Diseases of the Skin presented the desired opportunity, and Messrs. Field kindly supplied a quantity of the ozokerit.

Ozokerit is a vegetable wax, so to speak, or, if you like to apply a more sensational term, " a burning earth." It is a hydro-carbon found in Moldavia, Wallachia, the Caucasus, and near the Caspian Sea. From the latter place it is obtained in great quantities, being largely used there for its illuminating properties. It was discovered some years since by a Russian military officer, who communicated the fact to M. Gustave Siemsen. The latter gentleman, it is asserted, introduced it into England. In the crude state it is of a dirty greenish colour, and of a light specific gravity, and somewhat fibrous in structure. When rubbed in the hand for a few seconds, feels like ordinary wax; it readily melts, and a rude candle can be easily made of the " raw material," and a cotton wick. A London firm, viz., Messrs. J. C. and J. Field, noticing its brilliant light when burned, decided to experiment with it for the purpose of making candles. To all appearance this was a most unpromising task. However, they have succeeded in converting the dirty greenish-black substance into the handsome snow-white refined ozokerit. " This," we are informed, " is accomplished by sundry processes of distillation and purification. The beautiful hard, white, waxy substance is as handsome as spermaceti, but not so transparent as paraffin, possessing, however, a brilliant gloss, and melting at a temperature of $140°$ Fahr. This high melting point (paraffin being about $125°$ F. and stearine $130°$) allows of the employment of a larger wick, and this,

combined with the natural brilliant light of the ozokerit itself, makes the candle burn with brightness." However, I may as well remark that the crude ozokerit and the yellow oil are the best for medicinal purposes.

The Messrs. Field inform me, referring to the oil, that "in distillation a liquid oil is produced," and which they have refined to a pale yellow. The coarse oil has a smell similar to paraffin, but not so unpleasant or strong. It is also a slight deodorizer, for I agree with Mr. Condy (*Disinfection and Prevention of Disease*, by Henry B. Condy, page 3) that disinfectants are of two classes—1st, Those which by fixing the organic matter in a form *unfavourable* to oxidation, thus reduce to the utmost its tendency to undergo chemical change, and which are more properly called *antiseptics;* 2ndly, those which more or less rapidly break up the organic matter by promoting oxidation and conversion into unputrifiable products, and which are alone properly designated true *disinfectants*. When cases requiring disinfecting measures are characterized by offensive smells, the materials employed against them are often spoken of as "*deodorizers*." With the latter the ozokerit oil may be classed.

The action of ozokerit appears to be similar to that of tar; it is not, however, so dirty. The crude is the best, but for private practice the refined may be employed mixed with glycerine. At the hospital we merely mix the dark ozokerit by heat, with equal quantities of linseed oil, which, although not a very nice-looking compound, and rather lumpy, still when rubbed well in with the hand soon melts. I think this slowness in melting an advantage, especially in such affections as psoriasis. The oil can be used combined with lard, but is inferior to the crude material. Their action appears to be that of a stimulant to the diseased skin. Without lengthening this communication by the recording of cases, I may briefly say that the ozokerit, compared with tar, "Hebra's tincture" (equal parts of black soap, tar, and methylated spirit dissolved by heat), carbolic acid, and oil of cade, holds its own. Of course, in many cases constitutional remedies were employed. It is only suitable for chronic affections, as eczema, of long standing and *unaccompanied* by much infiltration of the sub-cutaneous cellular tissue, psoriasis, tinea tonsurans, and scabies.

I have suggested to the Messrs. Field, who are also great soap manufacturers, the desirability of making an ozokerit soap for medicinal purpose.

Art. XVII.—*Notes of Cases, with Practical Observations.*   By R.
Fitzmaurice, L.K. & Q.C.P.I., L.R.C.S.I.; Physician to
Tralee Dispensary.

The frequent observance in my practice latterly of pneumonia in
children and infants, and in some cases in which chest symptoms
were absent, has led me to conclude that the disease is often mis-
taken for other ailments, as dentition, remittent fever, worms, and
bronchitis, and has caused me to publish the following few cases
out of many, with the view of drawing attention to the prevalence
of the disease, and the value of blistering as a means of treatment.
It seems difficult, no doubt, to diagnose pneumonia in the child,
from the struggles of the little patient, but by keeping the ear
perseveringly to the chest, when exhaustion takes place, the hurried
breathing facilitates the discovery of tubular breathing, the first
sign of pneumonia generally observed in the child, however closely
the case may be watched.   Dr. West, in his admirable book on
Diseases of Children, at page 6, states that if the posterior part of
the chest is free from a considerable amount of crepitation we may
conclude that the infant is not suffering from any serious disease of
the lungs.   This remark seems to me to be inaccurate, as in my ex-
perience simple hepatized lung is oftener found in other parts of the
chest than the posterior, the usual seat of it in the adult.   Blistering,
though abandoned by some practitioners, is, in my opinion, the sheet
anchor in this disease.   Dr. West has given up blistering, and he
says if a blister is applied the blistered surface should be pricked with
a needle and the part then dressed with French wadding.   In this
advice the mistake lies.   If a blister is put on an infant, left on
a suitable time, the part then dressed with mercurial ointment on
lint, and then covered with French wadding, kept on with a few
strips of adhesive plaster, and not removed for some days, unless
the blisters break, nothing but good will result from it; but if the
blisters are cut or pricked, air will enter, a raw surface be exposed,
and a troublesome sore probably result.   Mercurial ointment, I
find, excludes air more effectually than simple dressing, and, no
doubt, has a resolving effect on the inflammation; and by keeping the
child as much as possible on the healthy side the bursting of blisters
will be avoided; and all practitioners will agree with the late Dr.
Graves that all good results will be achieved without opening.

Called to see Connor, a year and ten months old, a child of a

poor man; found him very feverish, heavy, prostrate, and thirsty; treated him for some time for teething, but his symptoms increasing I suspected that something more serious was the matter, and examined him closely for some days, at the end of which time I observed that the upper part of the right side did not expand equally with the left; detected slight dulness under the clavicle, attended with tubular breathing; blistered immediately, and dressed blistered surface with mercurial ointment and French wadding, and rubbed mercurial ointment in the ordinary manner into the armpits. Next day the little patient was quite lively, tubular breathing replaced by respiratory murmur, and all symptoms much relieved; recovery in a few days. This child was very ill indeed, and had to be sustained with chicken broth and wine before treatment was directed to the inflamed lung.

Shanahan, a child of a shopkeeper, six months old, attended by an apothecary for some days, and treated for worms. His state becoming alarming I was called to see him, and found him very ill, lying on his back; belly tympanitic, breathing very hurried, and the case apparently hopeless; examined him closely, and found dulness on percussion, and tubular breathing under right clavicle. Ordered enema of asafœtida; belly to be stuped, and treated the hepatized lung as the case given above. Next day he was much improved; however, his pulse continuing high, and stethoscopic examination disclosing respiratory murmur over the blistered part, but tubular breathing in the axilla of same side, attended with dulness on percussion, I blistered this part immediately, and next day symptoms were much lessened; respiratory murmur in axilla, and recovery in some days.

An infant, six weeks old, for some days brought to dispensary, and got expectorants for cough and oppression. The child continuing very ill, and getting worse, I made an examination of the chest, and detected dulness on percussion, and tubular breathing in right axilla and along the lower edge of the great pectoral muscle; put on rather a large blister that covered all the dull part; blistered surface dressed with mercurial ointment and French wadding; respiratory murmur restored next day, and recovery very soon. The blister in a few days shrivelled up, and healed without a bad symptom.

Almon, a child of a shopkeeper, ten months old, got symptoms of croup on the night of the 1st January last; called to see him on the following night, and found him in high fever, stridor, croupy

cough, and much oppression; ordered him immediately to be put into a warm bath, and left in it for ten minutes; gave a teaspoonful of hippo wine[a] every ten minutes till vomiting occurred. He was somewhat relieved, but next day became very ill again. I then used a solution of tartar emetic, which had to be stopped very soon, as he got very weak and oppressed; became very soon almost hopeless, and as a last resource I put him on strong decoction of senega, as recommended by Dr. Gibb in his book on *Diseases of the Throat;*[b] of this decoction he took during the night a pint in dessert spoonfuls, and next day I was agreeably surprised to find him much less oppressed, and cough soft and loose. I stopped the decoction during the day and gave him chicken broth—but toward evening the symptoms of croup returned, and he got within a short time an ounce and a half of hippo wine in teaspoonfuls every ten minutes. No amendment taking place I ordered him another pint of the decoction of senega, to be given during the night, and on commencing it he began again to improve, and recovered ultimately; his recovery attributable, no doubt, to the decoction of senega, as the case was apparently beyond the time for the operation of tracheotomy. In a day or two after the croupy symptoms had subsided I remarked that he had a catch in his breathing; his pulse continuing high I examined his chest closely, and found hepatized lung near the base of the left scapula. I blistered the part immediately, and dressed the blistered surface with mercurial ointment and French wadding as in the other cases, and the little patient made an excellent recovery. When the lung begins to resolve mercury in any form is stopped at once, and the ointment washed off the armpits.

CASES OF EFFUSION INTO THE CHEST.

Miss M. D. was feverish for some days, and found her as follows: Pain in left side with high fever; examined chest and found no signs of pleurisy or pneumonia; applied a few leeches to the side, and gave some mild aperient medicine. In a few days enteritis set in, evidenced by constipation, tympanitis, and tenderness of abdomen,

[a] In reading over the review of Dr. Spence's work in the last number of this Journal I see he prefers hippo wine to tartar emetic in the treatment of croup, and this quite accords with my practice for some years past.

[b] Senega root two ounces, well bruised and broken up, boil in a pint and a half of water in a small saucepan down to a pint, strain, and cool it, and administer it in doses of a dessert spoonful every ten minutes till free vomiting takes place with expulsion of membrane. In the case of Almon no vomiting occurred from the administration of the senega, yet it had a wonderful effect on a most *hopeless* case of croup.

with high fever; leeched the abdomen freely, stuped, gave enemata of asafœtida and turpentine, and rubbed mercurial ointment into the armpits and groins. She continued for some days in apparently great danger; symptoms unsubdued; when suddenly the abdomen relaxed, and after this the bowels were moved, but the pulse continuing high, and the child very ill, I examined the chest again, and found dulness on percussion from the middle of the scapula to the base of the lung, and over this part there was feeble respiration; blistered immediately, and continued the mercurial inunction. The effusion increased, and dulness was observed in the axilla, along the edge of the pectoral muscle, and under the clavicle. At this time the heart was dislocated to the right side, but what was extraordinary that in a few days there was marked tympanitic dulness from the clavicle to near the nipple, and over this part there was loud cavernous breathing, signs that were observed for two or three successive days of accurate observation. At this time the child was emaciated to a degree; no appetite; *pulse very high and weak*, and she was unable to move in bed. I concluded from the symptoms and signs that the case was one of pleuro pneumonia, ending in a rapidly formed cavity, either phthisical or pneumonic, or an enlarged bronchial tube. The opposite lung during this time was quite free from disease, and the breathing puerile. From her state of debility, very quick pulse, and emaciation, coupled with the physical signs, I gave my opinion that she could not recover. Of course all mercurials were stopped, wine and nourishing diet enjoined, and tincture of iodine painted under the clavicle, and under this treatment, by slow degrees, she got better, and most unexpectedly recovered. In some months after I examined her chest and found no trace of disease; respiration equal at both sides, and the child is now plump and healthy. Some months after this case a child named Quinell, 18 months old, was brought to my house as follows:—irritable, emaciated, pale, and oppressed, pulse very quick, and suffering from pemphigus gangrenosa on different parts of the body. On examining the chest, which was very difficult, from the child's irritability, tympanitic dulness was observed on the anterior and upper part of the right lung from the clavicle to the nipple, and over this part the breathing was somewhat louder than puerile; at the lower edge of the great pectoral, near the nipple, distant tubular breathing was heard, with a large crepitus, and all over the posterior part of this side of the chest there was absolute dulness on percussion, absence of respiratory murmur, and want of local

vibration. The only sign observed in the opposite lung was numerous bronchial râles all over it. This was a most unpromising case, but from my experience of Miss D.'s case I announced to the parents, which appeared to them ridiculous, that the child was likely to recover. I ordered tepid salt water baths daily, gave cod liver oil, syrup of iodide of iron, nourishing broth and milk, and had tincture of iodine painted externally, and the " burnt holes " dressed with equal parts of oxide of zinc and spermaceti ointment. The recovery was so slow that it was scarce perceptible for some months, and the parents often questioned the advisability of further treatment; however, the old grandmother, who nursed the child, persevered against hope, and the result was complete recovery, and the child is now perfectly well and healthy.

Remarks.—The point of interest in Miss D.'s case refers to the tympanitic dulness and cavernous breathing under the left clavicle, the solution of which seems to be very difficult. We know that a tympanitic state of the chest may result from different causes—as secretion of air into the pleural cavity, pneumo thorax, a large cavity, an enlarged bronchial tube, and a distended stomach, but in this case we cannot, I think, attribute the physical signs in question to any of those causes. I have observed, after solidification of the lung, attended with tubular breathing, that for some time puerile breathing is heard over the part, and may there not have been in this case pneumonia of the upper part of the lung, which was more or less pushed upwards and forwards by the fluid behind, and when the resolution of the pneumonia took place there may have been an expansive state of the air cells and small tubes which gave rise to the cavernous breathing, or may the lung be compressed by secretion of air, and the cavernous breathing conveyed from the trachea? I would be inclined to adopt the former view, as the breathing appeared so close to the ear, and gave the idea that it came from a large cavern. In Miss D.'s case the sound on percussion partook more of a tympanitic state than a tympanitic dulness. In Quinell's case it was more of a tympanitic dulness, and therefore the breathing in this latter I did not consider cavernous, but louder than puerile. However this may be, tympanitic dulness on the anterior part of the chest I look upon as one of the signs attendant on pleuritic effusion, especially in children, and if distant tubular breathing is heard elsewhere, at that side, it confirms the diagnosis (of course with other signs) of effusion into the pleural cavity as opposed to phthisical abscess.

Art. XVIII.—*Further Evidence in favour of a Hill Residence for European Soldiers in India.*[a] By William Curran, L.R.C.P., Edin.; M.R.C.S., England, &c.; Assistant Surgeon Army Staff.

The importance of locating as many European soldiers in the hills as can be safely spared from the plains, having been already freely discussed, and, as I believe, fully established, it now becomes a duty to ascertain the class of cases for which a hill climate is most suited, and inquire into the circumstances under which troops might be most advantageously massed in them.   The conviction daily gains ground that the Himalayas are the proper and most suitable residence for the European troops that are serving in India, and the man who by devoting a portion of his time to the task of collecting reliable data, statistics founded on fact and free from fiction, and thereby influencing the public mind in their favour, would be doing a service to the country which it is impossible to over-estimate, and conferring a benefit on his brethren in the army, the extent of which it is not easy for an untravelled Englishman to realize.   I am aware that no little divergence of opinion and conflict of authority exist in reference to this question, but the same may be said of other and perhaps more important matters, and it is to reconcile or modify these as far as I may that I write.   I need not go into detail, for my object is not controversy, and it will appear as I proceed that I agree in the main with the two principal disputants.   Both are right from their respective stand points, and no one, as far as I know, has been bold or stupid enough to deny that a cool climate is more congenial to health than an excessively hot one.   The evidence adduced by myself elsewhere, and furnished in much greater abundance by others, proves this with almost the certainty of a demonstration, and many diseases which are common in the plains are rarely, if at all seen, and then only in a much milder or more tractable form in the hills.   Those terrible scourges cholera, dysentery, and sunstroke, which have proved so destructive in the former are almost unknown in the latter, and all sanitarians are now agreed that " newly arrived lads, whether. as recruits or entire regiments, should proceed to them direct."

" A few years ago" to use the words of a writer in the *Pall Mall*

[a] See my paper, "The Himalayas as a Health Resort," in the Practioner for January, 1871.

Gazette, " the royal commission on the sanitary state of the Indian army, had under consideration the possibility of stationing troops, and arranging for them tours of duty in such a way as to render their services less hurtful to health. After carefully examining the subject they arrived at the conclusion that it was advisable to reduce to a minimum the strategic points in the hot plains, and hold in force as few unhealthy stations as possible; then to quarter at least a third of the troops required to hold these points on adjacent hills and stations which should enjoy the best sanitary regulations. From that to the present time, this important question has been discussed only in a desultory sort of way, and has never been properly considered in an imperial sense." That was strictly true when written, and is indeed quite applicable yet, and I apprehend that something more than the report of a roving sanitary commission will be required before its provisions are carried out, or regiments are sent as they ought to be, straight from home to the hills. A royal or sanitary commission is a very good thing in its way; it asks numerous questions and elicits sundry answers, its members fare sumptuously, and travel *en grande tenue* at the public expense; and it issues a report which furnishes material for some spicey leading articles in the papers, and then goes to the pastry cooks and cheesemongers. And this is often about all the good that comes out of it. The value of its suggestions is acknowledged on all sides, but they are never acted on, its deductions from facts are unassailable, but the latter were known to every one before, and the consequence is that things remain pretty much as they were, and that all the tall talk, fine writing, and costly publication, go for nothing. They sometimes, indeed, lead to worse by making or magnifying difficulties which their members may have created, and thereby affording means of escape from action to those who may want or wish to avail themselves of them.[a]   *Laudatur et alget,* and

[a] What Carleton, the Irish novelist, says of parliamentary committees in general, in his story called "Tubber Derg or the Red Well," equally applies to sanitary and royal commissions. Alluding to the mal-administration of the poor laws, and to the necessity of studying the question among those who suffer from it, he says—"As for parliamentary committees upon this or any other subject, they are, with reverence be it spoken, thoroughly contemptible. They will summon and examine witnesses, who, for the most part, know little about the habits or distresses of the poor; public money will be wasted in defraying their expenses, and in printing reports; resolutions will be passed; something will be said about it in the House of Commons; and in a few weeks, after resolving and re-resolving, it is as little thought of as if it had never been the subject of investigation. In the mean time the evil proceeds— becomes more inveterate—eats into the already declining prosperity of the country—

to show that such is really the case in the present instance, I sub-
join a table taken from an official source, from which it will appear
that only 5,844 men were in the hills in 1870, out of the whole of
Bengal, and this too during a season in which the transfers from
the plains were unusually numerous.

Abstract.—*Return of the Number of Troops, Soldiers' Wives, and
Children, that were stationed in Hill Stations, Convalescent Depôts,
or employed as Working Parties in the Hills during the hot season
of 1870.   See Military Department, Letter No. 405, dated 28th
May, 1870.*

PLACES	DETAIL OF STRENGTH								REMARKS
	Officers	Sergeants	Rank & File	Total N. C. Officers, Rank and File	Wives	Children			
						Over 10 years	Under 10 years	Under 2 years	
At Hill Sta-tions, -	123	180	2,914	3,094	270	34	246	138	The Hill Stations, so call-ed, are Bagsoo, Chuc-krata, Dugshai, Ranee Khet, and Subathoo. The Convalescent De-pôts are Darjeeling, Nynee-Tal, Landour, Dalhousie, Kussowlie, and Murree and Cliff-den, and troops were employed as working parties in some of the former, as well as more specifically at Chung-lagully, Khyragully, Chumba Roads, and Kalabagh.
At Convales-cent Depôts,	63	134	1,807	1,941	262	46	308	107	
Working Par-ties, -	40	53	1,123	1,176	50	5	56	23	
Total,	226	367	5,844	6,211	582	85	610	268	

Something more has doubtless been done since, as it is well
known the present popular commander-in-chief is bent upon
effecting a radical change in the allocation of the European troops
so happily placed under his command, and " the important question
of hill sanitaria, in its widest sense, is attracting especial attention
in India at the present time."

When stationed during last summer, at Kussowlie, a small hill
station in the Sirhind division, about 45 miles from Umballa,
which is situated on an isolated hill 6,000 to 6,500 feet above sea

whilst those who suffer under it have the consolation of knowing that a parliamentary
committee sat longer upon it than so many geese upon their eggs, but hatched
nothing."

level, in lat. 31, and long. 77, and which commands a good view of
the snowy range, and also of the stations of Simla, Subathoo, and
Dugshai, I determined to turn my residence there to some account,
and ascertain, as far as the opportunities at my command would
allow, the advantages or otherwise of hill sanitaria for European
residence.   I was anxious to test their capacity for restoring health
that had been lost or damaged by service in the plains, their
immunity from malarious or other injurious influences, or *vice versâ*,
and finally, I wished to know if there was any foundation for the
charge urged against them by some to the effect that a residence in
them sometimes originated or reproduced disease that might other-
wise have never appeared, or that might have lain dormant in the
system for years.   This, it must be allowed, was rather an ambitious
flight for a man of my calibre.   I perhaps, aspired beyond my
strength, but then the object was a good one, and failure in such a
cause can scarcely be said to entail reproach.

I left the plains after several years' continuous residence in them,
with the solemn conviction that prevention was better than cure,
that physic though it might in many instances relieve suffering,
and in some cases check the progress of disease, yet was a weapon
of uncertain temper and questionable potency in an encounter with
tropical disease, and I was anxious to regain confidence in the
virtues of an art which I liked for its own sake, which I had done
my best to master, and which I had practised with some success in
other climes.   With these views I entered upon the inquiry, and
the general result is given below.   To make this more intelligible,
it will be necessary to say a word or two about the station itself,
but this need not detain us long, a few leading touches will suffice,
and on the principle of " *ex uno disce omnes*," what may be said of one
will, in a general way, apply equally to all.   I will only add that I
reached the place about the middle of May, consequently about the
hottest period of the year for that locality, just before the rains set
in, and that I left it late in October, when all trace of the latter
had passed away, and when the absence of haze drift and the crisp
transparency of the atmosphere generally, enabled the eye to realize
the grandeur of the scene, and revel over the beauties of a
panorama, which could not easily be surpassed.   In other words, I
left it just as residence there was becoming most enjoyable, and
after a season of unprecedented severity in the hills, during which
the ordinary features of disease were aggravated by the rigors of
climate, and complaints that would scarcely call for treatment

elsewhere were turned into serious illnesses. This should be borne in mind in any inferences that may be deduced from the conclusions I have arrived at, and it should never be forgotten that the constituents of the depôt were feeble men, whose health had given way in the plains, and whose cases were in the main utterly unsuited for such a climate.

The ridge on which Kussowlie stands is about three and a half to four miles in length, about half a mile of which, at its extreme western end, is occupied by the barracks and hospital, while the remaining portion is thickly studded with private houses that are inhabited by the families of officers in the plains from April till October. The soil is light and porous, resting in some parts on a sandstone basis, in others, on calcareo-argillaceous rocks and indurated clays of various colours; and the prevailing diseases of the natives are intermittent fevers, diarrhœa, syphilis, goitre and calculus vesicæ. The hospital is beautifully situated on an isolated spur at the very extremity of the ridge on which the station stands, lower than, but within easy reach of the barracks, with an east and west aspect, and a commanding view of the hills about Simla. It is double-storied and open to currents of air from every direction, large covered verandahs surround it on all sides, and its sanitary surroundings are good. The wards are, on an average, 30 feet long, 20 feet wide, and 16 feet high; they are calculated to accommodate eight patients each, and give a cubic space of 1,289 feet, or a superficial of 78 feet to each patient. The water is obtained from wells on the north and south sides, and the following analysis of it, taken from an official source, will better show its quality than any description I could indite:—

	North Source.	South Source.
Total hardness -	4·32	4·2
Permanent hardness	3·70	1·818
Removable hardness	·62	2·382
Total solids in 70,000 grains	8·96	7·22
Volatile matter	·350	·26
Mineral matter -	8·610	6·96
Amount of oxygen needed to oxidize organic matter of 1,000 grains	·000,700 grs.	·000,137 grs.
Re-action before and after boiling, feebly alkaline		
Earthy salts insoluble in water -	6·043	5·10

	North Source.		South Source.
Carbonate of lime from insoluble matters - - -	-	4·573	- 3·86
Chloride of sodium -	-	·816	- ·16
Sulphate of soda -	-	·429	- ·945

It is brought up in skins on the backs of mules, and is sparkling and agreeable to the taste. Beer of fair quality is manufactured in the station, and potatoes, maize, and barley are the principal products of the district. The rain-fall varies a good deal from year to year, but the average is about 70 inches, more or less, according to season, and I subjoin below a carefully prepared table of the temperature which is taken from a local source, and which will give a better idea of its variations and range than any statement I could offer :—

1868	Highest in Month	Lowest in Month	Ranges in Month	Means of all highest	Means of all lowest	Mean daily Ranges	Approximate Means for Months	REMARKS
June, -	89	59	30	78·10	65·50	14·70	71·80	The only points calling for notice in connexion with this table are the great differences of temperature that obtain in the same month, and the ranges or variations which take place during the rains. These are very trying to weakly men; and it is no wonder that many diseases are aggravated by them which might be alleviated by heat or the more relaxing atmosphere of the plains.
July, -	87	55	32	77·82	63·71	14·40	70·76	
August, -	83	55	28	77·25	64·21	13·03	70·73	
September, -	79	59	20	74·96	63·82	11·35	69·39	
October, -	80	51	29	69·90	54·10	12·10	62·40	
November, -	66	46	20	60·67	50·21	10·46	55·44	
December, -	60	36	24	52·53	43·07	9·46	47·80	
Means, -	77·71	51·57	26·14	70·17	57·80	12·21	64·04	

The point will be still further illustrated as we advance, and the differences will then be more clearly appreciable. They are unfortunately too great to be good for health in either place, and it is unfortunate that extremes are the order of the day everywhere in India. Finally, the station is well-shaded by trees, chiefly of the spruce fir variety, but other descriptions obtain, and

the deodar and rhododendron are sparingly met with. Snow lies occasionally on the ground towards mid-winter, and fires are in request from October to April.

I have given these general particulars of Kussowlie, as it is the station in which I served longest myself, and with which I am best acquainted; but what can be fairly said of one, applies generally to all,[a] inasmuch as the geological formation and other peculiarities are pretty much the same throughout the Himalayas, and the following remarks are intended to apply to the whole range; one station may be more favoured than another in respect of shade, rainfall, and water supply; the social attractions of one may be greater than those of another; but the same sun shines equally over all, and it is our duty to watch its working and see how far it influences the conditions with which we are most concerned, or conversant. And, first, as regards that bugbear of the Himalayas, hill diarrhœa, which prevails during, if it is not mainly induced by the rains, when the atmosphere is surcharged with moisture, and haze drift covers the hill sides, there are various opinions. Of these, however, I do not mean to take notice in detail here, and the following contains, in substance, all that I personally know, or consider necessary to communicate respecting it at present. To avoid unnecessary subdivision, I would say at once, that it occurs in two forms, first, under the form of a pale, yellowish mass, which retains for some time the consistence of ordinary fæces, but soon becoming whiter and more diffluent, ultimately assumes a putty-like hŭe and fluid character, or is squirted forth as a dirty opaque liquid, with much force. The stools are, at first, copious, and accompanied by the discharge of large volumes of gas, but they soon diminish in quantity, and consist, after a few days, of little more than mucus and slime. The tenesmus, griping, and calls to stool, appear to increase in urgency as the discharge declines in quantity, the patient strains ineffectually, or sits without obtaining

[a] Facies non omnilresuna, nec tamen diversa
Sed qualis debetesse sororibus. (I quote from memory and may be wrong.)

The heights, above sea level, of hill stations may be roughly estimated as follows :—

			Feet
Subathoo	-	-	4,000
Dugshai	-	-	6,000
Nynee Tal	-	-	6,000
Kussowlie	-	-	6,500
Laudour	-	-	7,000
Darjeeling	-	-	7,600
Murree	-	-	7,800

relief over a pan, and the disease resembles, in the early part of its
course, dysentery. It might indeed be called, at this stage, a
dysenteria incruentia, but there is no blood, and I can testify from
personal experience that its effects are very depressing. Should it
persist, as it not unfrequently does in spite of every precaution to
the contrary, it leads to loss of appetite and flesh, and finally
to death by asthenia. In the other and more frequent form, the
patient passes large quantities of a dirty discoloured fluid like
pea-soup, which contains numerous nodules of broken fæces in sus-
pension, which look like pieces of split pea or mustard, and are
almost inodorous. These are often voided with force, and much
escape of flatus, but the disease generally passes away with the
evacuation, and there is less griping and irritation about the
rectum in this variety than in the other. It is, in fact, a much more
tractable malady than the other, and though very liable to recur,
and productive, while it lasts, of much inconvenience and debility,
it yet rarely becomes chronic and scarcely ever proves fatal. It is
called the windy diarrhœa by the soldiers on account of the
intestinal noises and distension it causes, and more than one officer
complained to me, while suffering from it, that his inside had been
converted into a machine for the manufacture of sulphuretted
hydrogen. Removal to the plains is the best preservative, and
failing this, alteratives, astringents, and such remedies as increase
the action of the skin, influence the biliary secretion, or improve
digestion, are indicated. As regards its cause, the public generally
ascribe it to the use of the hill water, but the analysis given above
shows that the water of Kussowlie is not to blame, and yet there
are not wanting medical men who take the same view of it. As an
instance in point, I will here quote the opinion of a Deputy
Inspector-General of the Indian Army, of many years standing,
who has had ample opportunities of studying the question, and who,
in a letter to myself, on the subject, writes as follows:—" I have
for many years past connected these hill diarrhœas with the
presence of sewage in some shape in the drinking water, and
I believe the best preventive to be boiling the water, and after-
wards filtering it through clean animal charcoal. These are
precautions I have for many seasons adopted in my own house,
and the disease is unknown among the members of my family.
Nor have I ever known our guests staying with us in the house to
be attacked. But I have more than once known guests coming to
us with the complaint, *cured* after a few days stay. Rightly

or wrongly I have always attributed this to the extreme care we exercise in obtaining the purest drinking water possible." So speaks one of the most experienced of Indian medical officers, and there are, I know, many others of the same service who think with him. On the other hand, a large number, with whom I may say I agree myself, ascribe its prevalence during the rains to that cooling of the surface that follows a journey to the hills, and to the frequent changes of weather that one experiences in the latter; changes so sudden and severe as often occasion a difference of 45 degrees between the morning and evening temperatures of the same day. However that may be, the complaint is always an unpleasant, and often a very intractable one, and when it leads, as it sometimes does to a fatal result, the appearances most observable on examination are a softish, sodden, or macerated condition of the mucus membrane of the large intestine, which extends sometimes into the large bowel, and is often protracted even as far as the duodenum. Indeed, I have heard the disease ascribed by some, to a pulpy, disintegrated condition of the covering of this part of the gut, which exhibits whitish blotches or blebs on its surface, that are not unlike an eruption of herpes. I have never seen this appearance myself, but am well assured that it sometimes exists, and patches of ill-defined ulceration, or rather of erosion, not actually amounting to ulceration, but partaking rather of the nature of desquamation, may be found in the cæcum and elsewhere. One may also meet now and then, a thinning and constriction of the large bowel near the sigmoid flexure of the colon, a warty, corrugated, or puckered appearance of the membrane of the rectum, enlargement of the mesenteric glands, and a flabby anæmic condition of the abdominal viscera generally. These are the changes I have discovered in the cases that came under my own observation, and these, it need scarcely be added, are quite sufficient to account for the emaciation and dyspepsia that prevail during life, and for the absence of fat, and the evidence of anæmia that are found after death.

[a] Lancereaux quotes the cases of two individuals who, after having presented various syphilitic manifestations, sank under obstinate diarrhœa, and in whom were found, " together with lardaceous degeneration of the liver and spleen, multiple rounded ulcers in the large intestine, cicatrices, and *warty looking excrescences.*"—A Treatise on Syphilis, Sydenham Society's Transactions, Vol. i., p. 317.

The following is a summary of the *post-mortem* appearances of one of the last, the best marked, and most pronounced cases of chronic diarrhœa aggravated by hill agency which I have ever seen. It will best speak for itself :—*Post-mortem* 10 hours after death—Body was very much emaciated and sunk in over the abdomen, and the

Though the advisability of sending healthy troops to the hills is now generally acknowledged, and though the question as to the advantages of working parties for road making, &c., appears to be settled by the evidence in their favour adduced by myself and others, yet is there grave reason to doubt their fitness for the reception of men whose constitutions have been greatly impaired by a protracted residence in the plains, or who suffer from organic disease of the brain, heart, lungs, or liver. But it may be asked where could such sufferers expect relief, and would any remedy short of a removal to sea, and a residence in Europe suffice? I think not, and the practice now in vogue of sending unsuitable cases to the hills, is calculated to aggravate the sufferings of the sick themselves, and bring into question the hygienic value of hill sanitaria generally. This will best appear from the table herewith subjoined,[a] which contains a summary of the cases of 50 men and 27 women, as they presented themselves to me in hospital or elsewhere, and as they were taken down by myself from their own mouths, and often in their own words. It is but fair to say,

---

pelvic and other larger bones were everywhere starting through the skin on the surface. Head not examined. Chest—the lungs were closely adherent on either side, but more especially so on the right, where the pleura had undergone some thickening, but in point of structure they were both healthy, and there was no appearance of tubercle or cheesy matter in either. Heart small and free from adventitious deposit, weighed $3\frac{1}{2}$ oz., and there were 6 oz. of clear fluid in the pericardium. Abdomen—Liver fleshy to the feel, and dense on section, with an unusually patulous condition of the portal veins, afforded no other appearance of change, and its tissue throughout was of normal character and consistence. The spleen and kidneys were both flabby and anæmic, and the cortical surface of the latter gave evidence of incipient amyloid degeneration on the application of iodine. Intestines outwardly attenuated and transparent, and quite free from fat, presented no peculiarity calling for notice ; but on closer examination the mucous membrane of the large bowel was found to have undergone considerable change, and several portions of it had disappeared by desquamation ; soft and macerated in the region of the cæcum, raised and indurated farther down, and converted towards the rectum into a soft pulpy mass, which easily yielded to pressure ; it displayed here and there patches of ill-defined ulceration, and its continuity was quite lost near the anus. The warty condition referred to above was here well developed, but while it resembled in one place the dirty, diffused, reddish hue of suppressed small-pox, in another it assumed a deeper tint, and its more dusky discoloration approached nearer in appearance to an attack of purpura. In a word, the membrane was everywhere altered in consistence as well as in colour ; it peeled off easily before the touch, or hung in shreds to the sides of the gut ; and this degeneration, by interfering with, if it did not entirely arrest absorption, was doubtless the cause of the emaciation and dyspepsia that precedeth death, and of the pallor and anæmia that followed it.

[a] These tables are unavoidably omitted for want of space in the present number of this journal.

however, that these notes were taken soon after the close of an exceptionally moist and inclement season, and the utter unsuitability of many of the cases will be apparent at once. Indeed, the strange views entertained by some medical officers about hill sanitaria and their curative powers, are more calculated to surprise than to edify a looker on, and the following cases that came under my own personal observation, will give a better idea of some of the selections that are made than any remarks I could offer. In the first instance a pale delicate lad, with tumid abdomen, puffy face, and œdematous extremities, was sent in a dying state to the hospital of my late regiment, at Agra, as soon as he had arrived there, on his way to the hills from Morar. He died soon afterwards; and on examination, we found a large quantity of dirty puriform fluid in the cavity of the abdomen; the bowels were matted together by flakes of recent lymph, the liver was cirrhotic, and there were several patches of old standing ulcerations in the cæcum. In a second case, the subject, as it was supposed, of chronic hepatitis, and which terminated fatally as the man was being carried in a dandy up the hill; extensive disorganization had taken place in the left lung, while the liver was quite sound; and in the third, which was regarded in the plains as a case of lumbago or chronic rheumatism, suppurative hepatitis was diagnosed on his arrival at Kussowlie, and on section the right lobe of the liver was found to be the seat of a large abscess. Cases of this kind are obviously unsuited for a hill climate, yet these often constitute the majority of those that are selected in the plains, and it is not to be wondered at, that their condition is aggravated by the change, and that they are themselves sooner sped on their journey to " that bourne whence no traveller returns." This will in some measure account for the unsatisfactory results described below, and show that greater caution in selecting cases is required in the future than would appear to have been exercised in the past.

With regard to that distressing palpitation and irritability of the heart to which soldiers are so subject, I examined seven well-marked and indubitable instances of both before I left Kussowlie, and found that though some relief was experienced by three, yet that the others were just as bad as they were in the plains, and all complained that the irregularity and steepness of the ground distressed them. Wherever organic mischief existed, it remained. The same may be said, *totidem verbis*, of the cases of phthisis I had under my care. They generally lose ground in the rains, which

they often regain in the colder months, but there is less tendency towards hæmoptysis, dyspnœa, and night sweating during the progress of this disease in the hills than in the plains, and all appeared to prefer the former as a residence to the latter. This is, at best, but a negative recommendation in their favour, yet it is as much as can be alleged of them in other and even more favourable instances, and the following note which I entered in my private memorandum book on the 22nd of September last will show this, and show also that the advantages of the hills have not as yet been properly availed of—if, indeed, their peculiar therapeutic value has not been exaggerated or misunderstood:—" As junior member of the medical board that sat yesterday and to-day to select cases for invaliding, I examined some hundred and fifty or more men, and ascertained that not one of these expressed himself willing or anxious to remain in India; and they were fewer still who described themselves as benefited by their stay in the hills. In a very large number of the cases that were sent up for fever, hepatitis, anæmia, and the like, there were signs of enlargement of the liver, and though there was evidence of improvement in many, several looked pale and anæmic, and all, or nearly all, had that pearly glassiness of eye and that pasty sallow look which indicate the presence of malarial cachexia. The conclusion forced upon me by previous experience was confirmed on the present occasion, and I am now satisfied that the hills are more calculated to maintain health than to restore it." To inculcate this simple but withal very valuable fact, is one of the objects of this communication, and this, too, is the lesson which the cases that came under my notice are calculated to teach.

These cases [b] speak for themselves; they require no analysis,

[a] The number brought before the board was 230, out of which 189 men were selected for the purpose of being subsequently brought forward for invaliding. This, of itself, shows the stuff of which the depôt was made, and proves the necessity of selection.

[b] The details are necessarily withheld for want of space, but the general results are given in the text, and, for greater precision, they will admit of being roughly classified as follows :—Fifty cases of men and twenty-seven of women were recorded under the conditions already specified—that is, they were dealt with indiscriminately as they presented themselves for treatment or otherwise, and there was no attempt made at a classification or selection in either case. Of the former, twenty were described as good, favourable, improved, or satisfactory ; and of the latter, fifteen were found to come under similar headings ; while all the others were either injured or unaffected by the change. This shows a much larger percentage of improvements on the part of the women than on that of the men, and so far tends to support the conclusions arrived at in the text, and show that the hills are more suited for retaining than restoring health.

and were we able to follow them out to the end, I make no doubt that the results would be equally unsatisfactory.   They obviously point, in some instances, to the necessity of substituting home for the hills, and for others they indicate a residence, if such could be found, which is free on the one hand from the depressing effects of a burning sun, from what Mr. Keeble would call " the torrid summer's sickly clime;" and on the other from the haze drift and drenching rain of a Himalayan hill-side.   They also confirm the views of Dr. Gordon, and prove that the hills, as used heretofore, can, at best, only be regarded as bad substitutes for a greater and more radical change to Europe.   It will be noted that whenever healthy men or women were sent up, or whenever men or women whose health had only slightly suffered in the plains came to Kussowlie, that they either improved or remained in *statu quo*, and the plan adopted there for, I believe, the first time last year, at the instance of Deputy Inspector-General of Hospitals, Dr. Munroe, C.B., of sending up men debilitated by climate and fever, and replacing these by others who had recovered their health, answered admirably, and is richly worthy of further trial.   This, however, could only be carried out in a few stations like Rawul-Pindee, Umballa, and Bareilly, and a larger measure of relief is clearly called for.

And to show that this might be advantageously carried out on a much more extensive scale than that heretofore allowed, I will now reproduce here two tables which give the strength and describe the admissions to hospital, prevailing diseases, and mortality of two regiments which suffered severely in the plains, and which were sent to the hills as they stood, without any selection being made, and with, it is to be feared in both instances, the general health of their respective constituents being very much below par. For these I am indebted to the courtesy of Drs. Roe and Teevan, of H.M.'s 41st and 3rd Regiments of Foot;[a] and though the access of cholera does not allow the former to speak very highly by contrast of the advantages of the climate of the hills, it must yet be remembered that the 41st went to them after having been greatly enfeebled by fever, bowel complaints, and other depressing diseases at Agra.   While in this condition cholera made its appearance among them, and carried off, as will be seen, a goodly number. Besides, Subathoo can scarcely be said to be a hill sanitarium at all; it can, at best, only be regarded as a kind of resting-place or

[a] Now of the 30th Regiment.

half-way house between the hills and the plains; and this shows the danger of half measures in a country like India, where epidemic disease is so rife, and where complaints that run for the most part a mild course elsewhere, often assume a fatal complexion from the beginning, or put an end to life at once. This complication should not be lost sight of in the calculation, and any one who has seen, as I have, the 41st Regiment at Agra and Subathoo, and compared its appearance in the former place with its physique in the latter, would at once notice a difference, and ascribe it without hesitation to its proper cause—the influence of change.

Dr. Roe, the surgeon of the regiment, writing to me on the point in October last, said, " No doubt Subathoo is not quite so healthy as the higher hill stations, but still the improvement it has wrought in the health of our men is very decided. The regiment is now in a very different state from what it was when it arrived in 1869, and even from what it was when I first made its acquaintance in February last." And having premised so much, I will now leave the table to speak for itself.

A Comparative Statement, showing the Strength, Admissions to Hospital, Deaths, and prevailing Diseases in H.M.'s 41st " The Welch Regiment," at Agra and in Subathoo. for the years 1867, 1868, 1869, *and* 1870.

Stations occupied by the Corps	Average strength of the Battalion in each year	Total admissions from all causes during the year	Total of deaths from all causes during the year	Rates of average daily sick to strength per cent.	Rates of deaths per 1,000	Prevailing diseases during the year	Number invalided each year	GENERAL REMARKS
Agra, 1867,	851·58	1,141	13	7·06	15·26	Bowel Complaints, Fever, and Venereal	37	
Agra, 1868,	846·66	809	8	4·60	9·33	Do.	47	
Marched from Agra to Subathoo on 12th of Feb., '69, and arrived at Subathoo 21st Feb., 1869,	842·16	1,081	37	4·98	43·93	Do. do, and cholera,	56	Sixteen of these deaths were caused by cholera.
Subathoo up to 12th of October, '70,	815·33	548	7	4·04	8·53	Fevers,	29	Two of these deaths were accidental.

The return so kindly furnished by Dr. Teevan tells a different tale, and will, in consequence, call for very little comment or critcism; indeed, were any such wanted, the best place to go for it would be the reeking and crowded graveyard of Meerut; and the graveyards of India disclose facts which do not admit of being ignored, and which serve as standing memorials of mistaken policy or faulty hygiene in the past.   Would that we might even now profit by the lesson they teach, and would that even at this eleventh hour we might turn to better account the splendid sanitaria that stud so thickly the slopes of the Himalayas.   When I stood before the monument of the Buffs, and read its terrible inscription—which I was unfortunately unable to copy at the time—and saw that it was inscribed to the memory of two officers, three colour-sergeants, three sergeants, six corporals, fourteen drummers, one hundred and eleven men, sixteen women, and forty-three children, and reflected that similar, though, perhaps, not equally aggravated records might be found in the principal graveyards of India, I was strongly affected, and turning towards the great mountains, whose mighty outlines could be dimly traced in the distance, I reflected that, had their sides been more freely availed of, this and similar sacrifices would never have taken place.   Had the 36th been in the hills in 1869, instead of at Peshawur, they would not have lost, as they did, 120 men, 11 children, 7 women, and 1 officer; neither would the 104th have lost 103 souls at Morar; nor the 58th been more than decimated, as it was, at Allahabad.   But it is unnecessary to multiply examples.   *Si quaeris monumenta circumspice*, if you require further proofs, go to the Blue Books and the cemeteries of India, and if these do not suffice, you will find them in abundance in the unpublished "annuals" of military medical officers.

This table lacks, unfortunately, the number of invalids sent home for change or discharge, but these are, at best, but an imperfect evidence or description of the state of a regiment, as surgeons differ a good deal in their views of the class of cases that are suited for or that require change to England, and it is hardly fair to saddle Dugshai with the consequences of a disease which originates at Meerut.   I cannot, however, help observing, that I think the invaliding follows in India too close on the heels of the hot season, by which many men, who might pull up in the cold weather, are so debilitated as to call for earlier change to England. A high departmental authority considers that many men are invalided who might be safely kept longer in India, and I, too,

quite agree that such is often the case; but due allowance ought to be made for the beneficial effects of a long sea voyage, and it is always safer to err on the side of the sick. But this is a phase of the question that may be more appropriately discussed elsewhere, and space forbids my going into it further at present.

Comparative Statement, showing the Strength, admissions to Hospital, Deaths, and prevailing Diseases in H.M.'s 3rd Regiment, "The Buffs," at Meerut and Dugshai, for the years 1867, 1868, 1869, *and* 1870.

Stations occupied by the Corps	Average strength of the Battalion in each year	Total admissions from all causes during the year	Total of deaths from all causes during the year	Rates of average daily sick to strength per cent.	Rates of death per 1,000	Prevailing diseases during the year	Number invalided each year	GENERAL REMARKS
Meerut, 1867,	679	1,058	133	5·74	195·87	Cholera spasmodica		Cholera prevailed in an epidemic form from 17th of Aug. to 1st of October.
Do. '68,	761	729	15	4·89	19·71	Diarrhœa and intermittent fever	This column was unfortunately left blank.	Regiment enjoyed good health during the year.
Marched from Meerut *en route* to Dugshai on 9th January, and arrived at Dugshai on 14th of April, 1869,	871	623	5	3·67	5·74	Ague and rheumatic affections		Do. do.
Dugshai up to 20th October, 1870,	886	366	5	2·87	5·77	Fevers of the intermittent & remittent types		Do. do.

But it has been well said that "statistics may be made to favour anything," and the truth of this phrase is well exemplified in the two tables given below. One of these gives the strength, mortality, prevailing diseases, temperature, and rain-fall of the depôt and hospital at Kussowlie, while the other gives similar information about the 88th Regiment that was stationed at Agra, and the

result is, on the whole, in favour of the plains. The difference
will, however, appear less striking when it is remembered that the
hot season of 1870 was everywhere mild in the plains, while its
counterpart was quite the reverse in the hills. Again, the 88th
had been effectually weeded of sick and weakly men when the
comparison began, and its general tone and morale had been im-
proved by a long march and by the assurance of an early return to
England. On the other hand, the depôt at Kussowlie consisted
almost entirely of men whose health had given way in the plains,
and who were in many, perhaps too far the larger number of
instances, quite unsuited for such a climate. Many, indeed, would
have been better in the plains, while others were in a condition
that called for change to sea, or admitted of no improvement from
any course of treatment. And in instituting a comparison of this
kind, it should never be forgotten that the climate of the hills has
been proved to be unfavourable to invalids suffering from organic
disease of the heart, liver, lungs, or bowels, and especially so during
the rains—the very period referred to within—when the variations
of temperature are so great as to necessitate precautionary measures
on the part of even the strongest, and aggravate any tendency that
may exist in the weakly towards catarrhal complications, congestive
disorder or fluxes. It is, in a word, more fitted for preserving than
restoring health, and hence the necessity for selection, and the
advantage of sending healthy troops *ab initio* to them—troops just
arrived from England, rather than those whose health has been
greatly impaired, perhaps irreparably injured, by repeated attacks
of fever, dysentery, or other *plain* disease. The comparison is not,
therefore, a fair one; yet is the table no less suggestive, and, as
such, I reproduce it here. It will explain itself; and, as intimated
before, the particulars it contains regarding temperature, rain-fall,
&c., will apply to other sanitaria as well. The same will also hold
good in connexion with the other table in respect of the plains,
and it will be easy to strike an average from, or base an estimate
on, the details of both whenever it may be necessary to compare or
illustrate the peculiarities of either of the places to which they refer

Too much is expected from the hills, and, as a consequence,
when they fail to realize the results that have been perhaps too
eagerly looked for from them, they are unjustly credited with
blame, and saddled with a liability which they do not deserve.
They will be more appreciated when they are better understood,
and to effect this is one of the objects of the writer of this paper.

TABLE *showing the Strength, Admissions, and Deaths at the Kussowlie Hospital from 1st April to 30th September,* 1870.

Period	Average strength of Depôt for the 6 months	Total of admissions from all causes of disease during the 6 months	Total of deaths from all causes during the 6 months from 1st April to 30th Sep, 1870	Ratio of admissions to strength per 1,000	Ratio of deaths to strength per 1,000	Prevailing diseases	Temperature			Prevailing winds	Rainfall	Remarks
							Max.	Med.	Min.			
1st to 30th April, 1870,	245·75	93	1	199·93	2·20	Rheumatism, Aguish Disorders, and Bowel Complaints.	82	63	45	S.W.	Inch 3 8/10	Regular rains set in on 12th June, and ended on the 4th of September. The deaths that took place resulted from :— Bronchitis, 1 ; Encephalitis, 1 ; Phth. pul., 2 (one of these was brought dead to hospital); Abscess of liver, 1 ; and Apoplexy, 1. Total, 6.
1st to 31st May, 1870,	423·50	104	1				92	76	60	S.W.	8/10	
1st to 30th June, 1870,	498·25	102	1				No	Thermometer		S.W.	21 3/10	
1st to 31st July, 1870,	503·25	108	3					Do.		N.W.	20 6/10	
1st to 31st Aug, 1870,	514·75	73	—				80	69	58	N.W	36 5/10	
1st to 30th Sept, 1870,	535·40	64	1				75	65	55	N.W.	16 1/10	
Total,	2720·90	544	7			Average,	82·25	68·37	54·50	Total,	99 5/10	

Table showing the *Strength, Admissions, and Deaths in the Hospital, 88th Regiment, at Agra, from 1st April to 30th September,* 1870.

Period	Average strength of Regiment for six months	Total of admissions from all causes of disease for 6 months	Total of deaths from all causes during the 6 months from 1st April to 30th Sep., 1870	Ratio of admissions to strength per 1,000	Ratio of deaths to strength per 1,000	Prevailing diseases	Temperature			Prevailing winds	Rainfall	Remarks
							Max.	Med.	Min.		Inch	
1st to 30th April, '70,	661·20	82	1				98	82½	67	W.	None	An unusually mild season for the plains, during which rain fell sparingly, the heat was not excessive, and there was no outbreak of disease anywhere. The rainfall was unusually great in the hills, and bowel complaints, hepatitis, rheumatism, and pulmonary complications were very numerous. The causes of death in the Regiment were fevers, hepatic abscesses, and gangrene of the lung.
1st to 31st May, '70,	656·00	78	1				99	87½	76	W.	None	
1st to 30th June, '70,	655·75	104	2				100	90	80	N.W.	12 3/16	
1st to 31st July, '70,	526·60	125	1				103	92½	82	W.	12 1/16	
1st to 31st Aug., '70,	527·00	104	—				94	85	76	W.	6	
1st to 30th Sept., '70,	527·50	97	—	166·07	1·65	Fever, of the intermittent type, and Gonorrhœa.	96	86	76	W.	None	
Total,	3554·05	590	5									

TABLE *showing the Number of Deaths that took place in the 88th Regiment, and the Diseases by which they were caused, during its stay of three years in the Punjab. These include the Deaths of Invalids that occurred en route to England during same period, as well as those that took place in working parties and at Sanitaria in the hills.*

Year	Station	No. of Deaths	Diseases by which these were produced	REMARKS
1867	Rawul Pindee	4	Continued fever, 2; diarrhœa, 1; secondary syphilis, 1.	Rawul Pindee is reckoned one of the healthiest stations in India, and there was a wing of the Regiment, 256 strong, detached as a working party in the hills.
1868	Peshawur	12	Hepatitis, 2; bronchitis, 1; phth. pulmonalis, 1; psoas abscess, 1; remittent fever, 1; del. tremens, 1; insolatio, 1; dysentery, 1; contd. fever, 1; typhd. fever, 1; aneurism of aorta, 1.	The insalubrity of Peshawur is proverbial; and so much does malaria influence the mortality, that the 36th lost 1 officer, 2 women, 11 children, and 120 men there by cholera in 1869. The 104th lost 90 souls there, and the Artillery 25 men, 3 women, and 7 children the same year.
1869	Nowshera[a]	25	Diptheria, 1; bronchitis, 2; contd. fever, 1; secondary syphilis, 1; dysentery, 3; feb. enteric, 1; congestive apoplexy, 1; suicide, 2; cholera, 2; del. tremens, 1; aneurism of aorta, 1; hepatitis, 1; phth. pulmonalis, 2; enteritis, 1; ague, 2; hepatic abscess, 1; pneumonia, 1.	Nowshera, on the Caubul river, is situated in the Peshawur Valley, and therefore under the same influence as its big brother. The heat there is sometimes almost unbearable in the hot season, and it is one of those stations that might be altogether abandoned.
1869	Attock	6	Phthisis pulmonalis, 3; aneurism of aorta, 1; ague, 1; hepatitis, 1.	A limstone rock, on the Indus, that rejoices in the unpleasant repute of being the "hottest hole in the whole of India."
1869	Murree	1	Phthisis pulmonalis, 1.	A favourite hill station, and the Sanitarium of the Punjab.
(In the Hills.)	Working Party	1	Bright's disease, 1.	See my paper in the *Practitioner* for January, '71.
	Nundkotre	1	Cholera, 1.	This is a small sanitarium, near Murree, that is no longer in use.

[a] The average strength at Nowshera was 706·00, as estimated for a period of fifty-two weeks, and this would, I suppose—for I have not the actual figures by me at present—constitute a fair average for the Regiment during the period here referred to.

People do not gather figs from thorns, neither should a judicious physician think of sending cases of Bright's disease or diabetes to Iceland or Spitzbergen. Yet this, I contend, or something very much akin to it, is what is done in India at present, and the consequence is, that a regiment which has passed nearly thirteen years in some of the worst stations in the plains, exhibits a bill of health at the end of its career there which may compare favourably with a similar record on the part of one of the healthiest sanitaria in the world. We will leave this to interpret itself, and then close the inquiry with a statement of our views on the subject generally.

The opposite table may be quoted in the same direction, as showing the mortality from mainly preventible causes which takes place in the plains in even healthy regiments which have the benefit of every expedient and appliance against injury that science can devise or money procure; and behold the result! It speaks too plainly for itself to require any further elucidation or comment at my hands, and suggests the pregnant question, How long are we to continue playing against nature and common sense at such desperate odds? The answer is, until public opinion declares against it at home, or the matter is taken up in a party or patriotic spirit in Parliament.

In reviewing the history of hill sanitation in India some ugly facts are brought to light which are as much calculated to startle us by their novelty as they are to sadden us by their surroundings. Among these the most discouraging are, that though the advantages of hill sanitaria have been known for years, and though their praises have been sounded so long as almost to tire by repetition, yet that it is only within a comparatively recent period that they have been turned to any account at all, and meanwhile epidemic disease has been stalking with impunity through the plains and numbering its victims by thousands. We do not hold a private firm or association free from reproach, when, from imprudent speculation or want of foresight, its managers abuse the confidence of their constituents, or turn it selfishly to their own account. Neither should a Government be held blameless which ignores such patent facts, and which, while testifying by its own individual acts its appreciation of the advantages of a hill residence, has yet allowed its defenders to pine away in an uncongenial atmosphere, or be decimated by disease, whose shafts might be easily disarmed or turned aside altogether. A prudent regard for the diminution of public expenditure and the disbursements of the State purse

ought undoubtedly be classed among the virtues of a financier;
but a too pinching economy is often fraught with danger in the
face of sudden demand or calamity, and that happy discrimination
of means to an end, that striking of averages which tells most in
favour of truth, that *juste milieu* which balances the weight of
probabilities with a view to their resolution in the State behalf,
and holds the scales dispassionately between the claims of conflict-
ing interests, is rarely acquired in the camp of the General, and
but occasionally only in the closet of the Minister.   It is because
this is so that I and others of my cloth have had to put ourselves
forward, often perhaps reluctantly, and sometimes, mayhap, in
seeming opposition to the directions of our department, but really
because the facts are too strong for us, and because we see no
other explanation of or escape from them.   Heretofore, 'tis true,
very great difficulties existed in the way of sending troops in large
numbers to the hills, but these have been removed in great part,
and even now a regiment could reach Kussowlie within a week of
its arrival in Bombay.   Were regiments sent to the hills instead of
to Hyderabad or Peshawur, we would hear no more of the horrors
of cholera, and there would be a stop put to that drain of time-
expired men which one daily witnesses during the cold weather in
India in the persons of robust, well-fed, disciplined men, who are
in the prime of life, and in the very flush and vigour of their manli-
ness, and who leave a country which can ill dispense with their
services for one in which the labour-market is often overstocked, to
recruit the ranks of pauperism at home, or of rowdyism in America,
or who return again to India with possibly diminished health, and
certainly at a three-fold penalty to the public.

There is another advantage in sending whole regiments rather
than detached parties to the hills, and that is, that the men are
kept together under their own officers, with all their own comrades
and home associations about them, instead of being knocked about,
as they call it, under men whose voices sound strangely in their
ears, and to whose ways they are unaccustomed.   There is more
in this than some are disposed to allow; and if we would rightly
estimate the peculiarities of the soldier, or measure the force of the
influences by which he is swayed, we must descend from our stilts,
and converse with him in his barrack-room.   In this alone lie the
secret springs of his movements; and it is from sources having
peculiar facilities of access to this inner circle that I derive my
information.   Bourienne tells us, that the greatest conqueror

known to modern history—he, who, through good repute or evil
repute, in sunshine and in storm, was the idol of his own country
and the admiration of the world—used to ascertain the name and
inquire into the antecedents of the most distinguished of his
followers; and while passing along a line would astonish whole
battalions by stopping suddenly in his course, accosting a man
familiarly, perhaps calling him by his name, and recounting to or
interrogating him on his former acts of bravery. Such a recog-
nition can scarcely be expected under our more exclusive *regime*,
and in an army constituted as ours is, such a proceeding might
savour of affectation, if it escaped censure at the hands of some of
our critics. In France, however, where the line of demarcation is
less finely drawn, the case is different; and the abolition of the
purchase system, and its necessary consequence, promotion by
merit and from the ranks, will have the effect of diminishing the
preponderance of caste in our army, and increasing assimilation in
our ranks. The soldier at present has very little in common with
his officer beyond his dress; he breathes an atmosphere of self;
lives in a world which is peopled with the creatures of his own limited
fancy, and to stand well with his comrades, or fall in with the bent
of current regimental liking, constitutes for him the nearest ap-
proach to perfection, and fixes the horizon beyond which his ambi-
tion rarely soars. These little points ought never to be lost sight
of in any legislation affecting officers and men. Their interests
are certainly not always the same; their sympathies do not
invariably run in the same groove; one has resources at his com-
mand to which the other rarely aspires and may never secure; and
that officer who would beget confidence and inspire faith, must treat
his man somewhat after the manner that the Arab does his horse—
that is, treat him well generally, humour him in the day of peace,
and trust him in the hour of difficulty and danger.[a] What's good
for the goose is also good for the gander, or *vice versa.* Every
officer whose services can be spared in the plains, and that may be
taken for granted in our present overcrowded cadres, is entitled to
two months' leave every hot season to the hills; and I hope the day

[a] The remark said to have been made by shrewd old Runjeet Sing to Lord Auckland,
after witnessing the splendid marching of our troops at Loodianah, may be appropriately
reproduced here. After commenting on and commending their fine bearing, he is
reported to have said, "that if he had such troops he would provide each of them
with a conveyance for himself, and so save him the trouble of marching at all." We
need not do anything like this, indeed its very opposite is what's most wanted, and that
can only be obtained in its entirety under the conditions referred to above.

is not far distant, when, instead of being allowed as a favour to run to them for a couple of months in the Summer, he will be ordered as a duty to reside in them permanently with his men, and only return to the plains for purposes of drill or exercise during the Winter.

And with regard to this latter contingency, were I asked to propose a remedy for the diseases and dangers incidental to service in the climate of India, I would point at once, and without a shadow of hesitation to the Himalayas as a residence for healthy European troops during the Summer, and to camps of exercise or cantonments in the plains during the Winter. The marching to and from these, the duties performed in them, the renewal of old acquaintanceship, and the emulation that would insensibly spring up between the different regiments, would afford the men composing them an amount of pleasurable exercise and enjoyment which they can rarely hope to enjoy under the present *regime ;* and the plains of India afford scope for manœuvring troops on a scale and under a sky which have no equal at that season elsewhere in the world. The great plains that stretch along the Sutlej and the Jhelum would accommodate hosts, compared with which the mightiest armies of Europe would sink into insignificance, and the dullest could scarcely fail of being influenced by the glorious memories that attach to the banks of these classic streams. Every inch of ground in that neighbourhood is sacred. Our men might there fight over again in fancy the terrible battles of Ferozeshah and Sobraon, and recall with feelings of triumph the mighty struggles of their fathers.[a] Too little stress is, in my mind, laid— in these matter-of-fact days—on such reminiscences. Yet are they the food on which the soldier loves to feed, and their influence might be cultivated with much advantage in our army. They are reverently treasured up in the breast of the fair-faced, manly Sikh, who hesitates not to recount them to his friends; and the people of

[a] Another advantage of concentrating troops in the hills is that they might be sent at once in overwhelming numbers to any threatened point, and so turned to more immediate account than they could possibly be now. This was well seen at the commencement of the first Sikh war on the Sutlej, when our scattered columns had scarcely time allowed them to form up ere they were attacked by a fresh and vigorous enemy in full force, and several of the officers that were summoned to the fray never arrived at all. On this head Mr. Arnold speaks as follows :—"When Lord Hardinge was on the Sutlej "—or Sutleje, as he spells it—" certain officers were ordered up to him ; they travelled by palanquin dâk, occupied a month and a half upon the journey, necessitated the labour of 7,000 bearers, and then but thirty of them arrived before the fighting was finished."—Dalhousie's Administration of India, by — Arnold, Vol. ii., p. 226.

India are, as a body, wonderfully tenacious of such recollections. A gathering of this kind would produce tenfold more effect than the costly pageants called Durbars, and be much less likely to generate cholera or other disease. Finally, they would impress the native mind with a sense of our power, which a few sickly regiments scattered here and there in the plains, and struggling along on relief from one unhealthy station to another, every other year or so, with a long train of pallid women and pot-bellied children, could never do; and under the system contemplated by me, only a few strategic points, such as Calcutta, Allahabad, Lahore, and Attock or Peshawur need be garrisoned at all, and then only, or in great part, by artillery. Such stations as abut on the hills, as Rawul Pindee, Umballa, and Bareilly might be given up at once, and their garrisons transferred to Murree or its vicinity, to the places named above in connexion with this paper, to wit, Kussowlie, Dugshai, and Subathoo, and to Nynee-Tal, or Almorah. But these details are beyond my sphere; they are, however, in my humble opinion, quite feasible, and the sooner they, or some equivalent scheme, is adopted, the better will it be for the health of our soldiers and the safety of our empire.

Were this programme carried out, I feel assured that we might look upon the days of cholera as numbered. We would also hear less of crime, and see scarcely anything of that intemperance, and of its possible consequence, insanity, which are now so comparatively common in our army in India. I remember reading some time ago, in an Indian paper, that many more suicides occurred during the terrible hot season of '69 than have either transpired through the press, or than are otherwise known to outsiders, and the writer accounted for their comparative prevalence as follows:—" We are not surprised at this when we consider the unusual severity of the present season, or the exceptional conditions to which soldiers are subjected in this country. Pent up as they are for many months together between bare walls, with no other companionship than that of their dogs and punkah coolies, and an out-look so barren and bleak as to lack even a tree on which one might in very desperation hang himself, it is no wonder that they are haunted by *ennui* in its worst form, and driven at times for solace to expedients which the law forbids, and morality would shrink from." It is, indeed, no wonder; but this unnatural condition would be quite unknown under the circumstances contemplated by me, and instead of being shut up like wild beasts for several months of the year, all restraint might cease, and the men who now pine away in the plains could

roam about *ad libitum* in the hills, and improve both their health and pocket by catching butterflies,[a] or practising any trade they may have learned at home. Verily the remedy is at hand if we only knew how to turn it to account. The Genius of the Hills might say to us—to transpose slightly the words of Mr. Keeble—

> The herbs *you* seek to heal *your* woe
> Familiar by *our* pathways grow ;
> *Our* common air is balm.

But none are so blind as those who will not see, and things will remain pretty much as they are unless public attention is drawn to the subject in this country, or until some patriotic Member will raise his voice in the same direction in the House.

And what avails, I would ask, the costly and complicated system of sanitation so ostentatiously paraded for our admiration in Blue Books and Royal Commissions if the stimulus of excitement is withheld, and the poison of *ennui* is compulsorily substituted in its place? Man, certainly, wants but little here below, but he wants that little occasionally flavoured with a spice of novelty. He does not live on bread alone; and he who interrogates nature in her simplest processes will find that the analogy is not far-fetched, and that to maintain efficiency it is advisable to interest the mind as well as to gorge the body. A great deal of military crime is, I believe, traceable to this source, and time, without a hobby to diversify its monotony, would sometimes hang heavily on the hands of even the most employed amongst us. A great authority has said—

> .   .   .   .   .   " Si non
> Intendes animum studiis et rebus honestis
> Invidia vel amore vigil torquebere."

And the utter sense of blank indifference with which an uneducated man contemplates mere barrack life in India, must of itself almost suggest courses at variance with health, subordination, and morality. The associations of the hearth have, we all well know, a great deal to do, even in more favoured climes, with the regulation of the conduct. 'Tis certainly a pity they cannot be indulged in to equal amount in India. This is, however, I need hardly say, with the class, and under the conditions referred to, quite impossible; but something might be done in another direction, and massing healthy troops in larger numbers in the Himalayas is the best substitute for home and its enjoyments that can be found in that country.

[a] A favourite source of amusement and profit to invalid soldiers in the hills.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Clinical Lectures on Diseases peculiar to Women. By LOMBE
ATTHILL, M.D., Univ. Dub. 210 Pages. Dublin: Fannin
and Co. 1871.

THESE lectures were addressed originally to the class attending
the Adelaide Hospital during the past year, as cases suitable for
illustrating the various forms of uterine disease presented them-
selves. They were subsequently published in the pages of our
contemporary, the *Dublin Medical Press*, and now appear in a
separate and more permanent form. The author tells us he was
mainly induced to publish them by the desire expressed by some
of the members of the class to have for reference a concise sum-
mary of the practice they had seen carried out in the hospital, and
also by finding, some time ago, in his capacity of Examiner in the
Queen's University, and subsequently in the College of Physicians,
the utter ignorance evinced by the majority of candidates, even
the most industrious of them, on the subject of the diseases of
women, an ignorance that they attempted to excuse by referring
to the voluminous character of the only works attainable on the
subject. Out of evil often cometh good, certainly the attempt to
remedy the evil here complained of—and it is an evil of which all
must be aware—has been productive of good, for it has procured
for us a most excellent though brief handbook on the diseases
peculiar to women, one that cannot fail to be of great use to
students, that will guide them to a right understanding of the
cases brought before them in their hospital practice, and that will
leave them no excuse for the neglect of this very important part
of their business. Nor is this all; to the busy practitioner this
book will be of use in many an emergency, not only assisting him
in the recognition of the various forms of disease most frequently
met with, but also forming a safe and reliable guide to their treat-
ment on sound and scientific principles.

The opening lecture is on the mode of examining patients, and
is one of the most useful. It describes the method of making a
digital examination, apparently a simple proceeding, but really one

requiring the greatest care and tact, and, when done as here directed, capable of affording most valuable information. Then we have a description of the most useful forms of the speculum and of the sound. The mode of using this latter instrument is shown by a plate; and though the method chosen for illustration is different from that directed by Sir J. Simpson, it is one we have often been in the habit of adopting, and one that, in many cases, will be found very convenient.

The next lecture treats of leucorrhœa. Retaining the old-fashioned generic term, the various forms of muco-purulent discharge, with their pathology and treatment, are carefully described, and then we pass on to derangements of menstruation. The lecture on amenorrhœa is exceedingly good. We are specially glad to see the use of Simpson's galvanic pessary recommended. In suitable cases its effect is very remarkable, and in our own hands it has led to the establishment of the function, and a consequent improvement in the general health, when all other means had failed. In treating of dysmenorrhœa we have the membranous, spasmodic, inflammatory, congestive, and mechanical forms described; and here, for the first time, we cannot go fully with the lecturer. There is a form of dysmenorrhœa of very common occurrence, of which no mention is made, unless, indeed, it be what is here described as spasmodic. It is characterized by a sense of *malaise* coming on several days before menstruation, with a sense of fulness in the abdomen, and pain in one or both groins, and pain in the back; one or both breasts become enlarged, full, hot, and tender; there is headache and general uneasiness. These symptoms are in some degree relieved when the discharge is established, especially if it be free, but not entirely, and if a careful examination be made immediately before menstruation sets in, the ovary is found to be enlarged and tender. The dysmenorrhœa is in this case plainly due to ovarian irritation, and must be treated accordingly; but for the other forms of dysmenorrhœa, even where it depends on congestion of the uterus, we must express our opinion, notwithstanding Dr. Athill's strictures, that the most effectual relief will be obtained by opening and maintaining in an open condition the os uteri, either by the means of the galvanic or other intra-uterine stem pressure, or what, in most cases, is much better, dividing the os.

Lectures five and six are devoted to the consideration of menorrhagia, and we would gladly quote them at length did our space permit. Polypus of the uterus comes naturally to be con-

sidered in connexion with uterine hæmorrhage. Dr. Atthill speaks chiefly of intra-uterine polypus, of which he gives several cases. In this his experience is remarkably at variance with that of Dr. Matthews Duncan, who, in a recent paper devoted to uterine polypus, almost altogether ignores the existence of the intra-uterine form, which is the more remarkable, seeing that it is to the great man, whose recent death has left such a void in the Edinburgh school, and, indeed, in the medical world, that we are indebted for our chief knowledge of the subject. Dr. Atthill describes the extra-uterine polypus very briefly, probably from not thinking it worthy of a more extended notice. Dr. Duncan seems to have only met with one case of intra-uterine polypus, or rather to have only once made the necessary examination to ascertain whether such a thing existed. But the method he adopted was slow in its action, and productive of much irritation. "Dilatation," Dr. Duncan says, "is effected by means of a tangle tent. Sometimes a small one may be first used to begin the dilatation, and after it has done all in its power, or in about twenty-four hours, it is replaced by a larger, and again by one even still larger. This exploratory operation may itself be injurious," he says, "even more so than the disease, which is as yet only suspected to exist. Metritis, ovaritis, perimetritis, para-metritis, are frequent results of this exploration, and death itself may be a consequence." With such a catalogue of evils before his eye, it is not to be wondered at that Dr. Duncan did not often seek for intra-uterine polypi. Dr. Atthill has been more fortunate. He adopts the method of exploration described by Dr. Kidd in the pages of this Journal, and, speaking of it to his class, he says—

"You have had frequent opportunities of seeing the process I have described carried out—and must have noticed the entire absence of unpleasant symptoms, after a proceeding so apparently severe as the forcible dilatation of the cervix uteri—I have therefore no hesitation in recommending you to adopt this course in your future practice, as being one which you have seen productive of such good results in this hospital."

Persistent hæmorrhage has more terrors for Dr. Atthill than the exploration of the uterus, and when bleeding from the uterus does not yield to treatment, he makes it "an invariable rule to dilate the cervix." In this we fully agree with him; and after a considerable experience we have no hesitation in expressing our belief that exploration of the uterus, properly done, is an operation devoid of danger, and one that ought to be performed when the cause of

uterine hæmorrhage is not apparent, and the bleeding cannot be controlled by the use of astringents.

It is possible, Dr. Atthill admits, that the polypus may become extra-uterine, but the risk of waiting for this is more than he dare encounter.

" If not interfered with, and that it be pedunculated, it is possible that in time the uterus may expel it, and that thus it may become extra-uterine and even appear at the vulva. Such a course however is far from usual. In general the hæmorrhage, which almost invariably accompanies this affection, runs down the patient, and compels her to seek for relief long before that stage can be reached, or, if she fail to obtain the requisite aid, consigns her to a premature grave."

Fibrous tumours of the uterus are considered in the next lecture; and then diseases of the ovary come under notice; and then we have two lectures devoted to the inflammatory affections of the uterus and its appendages, one to its displacements, and one to its malignant diseases.

We have thus, in a short space, an excellent compendium of the present state of our knowledge of the more important and common diseases of women. With such a book in their hands, and an opportunity of seeing the practice of an hospital where diseases of women are treated, students have only themselves to blame if they do not obtain an excellent knowledge of the subject. We think Dr. Atthill has done good service in publishing his lectures, and we most strongly recommend them to the careful and attentive perusal of all who wish to study the diseases of women.

Selected Obstetrical and Gynæcological Works of Sir JAMES Y. SIMPSON, Bart., M.D., D.C.L., *containing the Substance of his Lectures on Midwifery.* Edited by J. WATT BLACK, M.A., M.D., &c. Edinburgh: Adam and Charles Black. 1871.

WHAT more fitting monument could be raised to Sir James Simpson than a complete edition of his works. A great hospital for women could only fix his name in the memories of those living in its immediate neighbourhood, and this only for a brief period, for, if successful as an hospital, the name of him in whose honour it was founded would soon be over-shadowed by its practical usefulness. But his works must live for ever; marble and brass will perish; hospitals will grow old and cease to exist, or be known

only as refuges for the sick; but the works of Simpson will live and recall his name wherever medicine is cultivated as a science, and so long as the human race is liable to suffer from pain or disease. We hail then, with pleasure, this first volume of his selected obstetrical and gynæcological works; we trust his other works will be added to the series, for his was no limited genius; and though he served medicine so well, he also laboured in many other fields; and most truly may it be said that whatever he touched he adorned.

The present volume contains all the more important of Sir James Simpson's contributions to the study of obstetrics and diseases of women, with the exception of his clinical lectures on the latter subject, which will shortly appear separately. On looking over it the first thing that strikes one is the great variety of subjects touched on, and then the vast number of things which have become " as familiar in our mouths as household words," for the first clear and definite teaching of which we here find that it is to Sir James Simpson we are indebted. Many of the papers have been reprinted from his *Obstetric Memoirs and Contributions* published in 1855–56; and many new papers have been added, chiefly short communications of a purely practical character, made to the Edinburgh Obstetrical Society. The notes he used for his lectures in the University of Edinburgh, and which contain the practical part of his course of midwifery are also now published for the first time. The book is edited by Dr. Black, who lived with him for five years as his assistant, and by constant association with him acquired an intimate knowledge of his opinions, modes of practice, and writings; and who has, in the few instances in which Sir James' practice had recently changed, appended a short state-ment of his later views. These observations Dr. Black has placed in brackets, with his initials attached, so that there can be no doubt as to their origin, or on whom the responsibility for them rests In this, as in every other respect, the editor has been most judicious, and we cannot avoid congratulating him on the manner in which he has discharged his task.

An analysis or criticism of such a book would require a volume as large as itself to do it justice. We shall not attempt such a task. Our ambition does not soar so high. We shall content ourselves with the more humble course of taking one of the essays and trying to show, from it, how this great man advanced our knowledge, and taking hold of a subject, with which many before him had attempted to deal, at once raised it from obscurity to

perfection.   But, first, we must say a word about these " Lecture
Notes." Well do we remember, when attending his lectures in the
session of 1844–45, the mode in which he used these notes. Before
each lecture, the notes for the day were written in clear round
characters on a black board and placed in the lecture-room, where
all who wished it had an opportunity of copying them into their
note-books, which they were advised to do, and to fill up after-
wards such illustrations and remarks as were made during the
course of the lecture.

It is to be remembered that these notes, of which the following
extract affords a fair specimen, formed the framework or skeleton
on which the teaching of the lecture was arranged, and are not to
be regarded as complete essays.   The present reviewer can say, from
his own experience, that the system was most useful to students,
and he is convinced there is nothing would contribute more to the
efficiency of medical teaching than its general adoption :—

" LABORIOUS LABOUR.

" *Definition.*—Head presenting, but morbid degree of retardation and
difficulty.

" *Pathological States inducing Laborious Labour.*

" 1. Deficiency in the expulsive powers.

" 2. Morbid position, conformation or size of the body to be expelled.

" 3. A morbidly undilated or contracted state of the canals through
which the body has to be expelled.

" These states may be present singly or in combination.   The degree
of difficulty induced by them leads to the sub-division into three *genera* or
orders.

" *Orders of Laborious Labour.*

" 1. *Tedious.*—The natural powers still sufficient with some accessory
regulations or aids from medical art.

" 2. *Instrumental.*—Extractive mechanical aid required, but safe in
principle to both mother and child.

" 3. *Impracticable.*—Impossible to extract a full-sized or living child
through the natural passages.

" FIRST ORDER OF LABORIOUS LABOURS—TEDIOUS
LABOUR.

" *a.* TEDIOUS LABOUR FROM MORBID PROTRACTION OF THE FIRST STAGE
BY LOCAL IMPEDING CAUSES.

" *Interference is to be regulated by*

" 1. The duration of the labour. The case becomes an anxious one if the
os uteri is not opened in twelve or sixteen hours after regular pains have
set in.   We may require to interfere much earlier than ten or twelve hours.

" 2. The power of endurance of the patient.

" 3. The strength and continuous regularity of the pains.

" 4. The degree of morbid pressure and irritation upon the os and cervix uteri.

" 5. The probability of the obstructing cause yielding to the natural efforts.

" *Dangers to be dreaded from Delay.*

" 1. Exhaustion of the contractile powers of the uterus.   Hence—
    (1.) Powerless labour.
    (2.) Irregular contraction.
    (3.) Hæmorrhage.

" 2. Irritation and inflammation, or even gangrene of the os uteri.

" 3. Injury and rupture of the coats of the uterus.

" 4. Fever—exhaustion—depression of mind.

" 5. Death of the child.

" *Local Impeding Causes which may produce Protraction of the First Stage.*

" 1. Rigidity of the lips and neck of the uterus.

" 2. Rigidity of a band of circular fibres in the cervix.

" 3. Impaction of a fold of the cervix between the head and the pelvis.

" 4. Premature rupture of the membranes.

" 5. Preternatural toughness of the membranes.

" 6. Over-distension of the uterus by liquor amnii.

" 7. Occlusion of the os uteri.

" 8. Oblique position of the os or body of the uterus.

" 9. Large size of the pelvis, leading to prolapsus.

" 10. Morbid relaxation of the soft parts, leading to prolapsus.

" I. RIGIDITY OF THE LIPS AND NECK OF THE UTERUS.
" *Varieties.*

" 1. The natural organic state of the parts (especially in first cases).

" 2. Spasmodic contraction.

" 3. Induration from disease, as cicatrices, inflammation, cancer.

" *Treatment.*

" Constitutional—

    " 1. Bloodletting.   This acts by
        (1.) Causing relaxation of the tissues.
        (2.) Removing the tendency to morbid congestion and inflammation, and thus restoring dilatability.

    " 2. Nauseants, as tartar emetic and ipecacuan.

    " 3. Warm baths.

    " 4. Hypnotics, as opiates and chloral.

    " 5. Chloroform.

" Local—

  " 1. Local detraction of blood??

  " 2. Local relaxant and sedative medicines.   Belladonna?   Stramonium??   Chloroform.

  " 3. Unguents and oils.

  " 4. Mucilaginous injections and enemata.

  ' 5. Warm hip bath and warm douche.

    6. Artificial dilatation by fingers or india-rubber bags.

  " 7. Incision.

" OPIUM IN LABOUR.

" *Indications to be fulfilled by Opium in Labour.*

  " 1. To suspend and control irregular and useless uterine pains—when the pains in fact became spurious.

  " 2. To allow the exhausted powers of the uterus to revive by rest (as when a rigid os uteri is dilated after much suffering).

  " 3. To allow the tissues of the os to become relaxed when there is no fear of pressure, and the patient is not able to bear venesection.

" *Rules for its Exhibition.*

  " 1. Use it only under the conviction that the pains are proportionally more hurtful to the powers of the mother, than useful in the expulsion of the child.

  " 2. Never suspend by it the uterine contractions when they are regular.

  " 3. Also, never when the head is so placed as to cause injurious pressure.

  " 4. Never administer it when there is general vascular excitement.

  " 5. Always have the bowels previously opened.

  " 6. Whatever preparation of the drug is used, and whether it be administered by the mouth, by the rectum, or hypodermically, let the dose be large."

If we were asked what has contributed most to our knowledge and scientific treatment of the diseases of women, we would unhesitatingly say the use of the uterine sound. This instrument now holds the same place with regard to uterine diseases, that the stethoscope does to affections of the thorax, and, while it is true of its use that the principle was known long before Simpson wrote his essay on the subject, just as the principle of auscultation was known long before Laënnec published his celebrated treatise; it cannot be questioned that the true value of the uterine sound was not recognized till Simpson taught it; and we may further add that he did

this so well, and so fully, that the labours of all subsequent teachers have added but little, if at all, to our knowledge of the instrument and its applications.   The *Memoir on the Uterine Sound* was read before the Medico-Chirurgical Society of Edinburgh, on the 19th April, 1843, and, in selecting it as a specimen of Simpson's writings, we are influenced no less by the excellence of the essay itself, than by a desire to make still more generally known this admirable instrument.

The first section of the essay opens with remarks on the value of physical diagnosis, and illustrations of the utter inadequacy of symptoms, as distinguished from physical signs, for correct diagnosis in uterine disease, and then the following propositions are stated and fully proved:—

" I. The General and Local Functional Symptoms of disease of the Uterus are such as enable us to localize, without enabling us to specialize, the exact existing affection of the organ.

" II. In almost all instances of diseases of the Uterus, it is only by the Physical examination of the organ itself that we can distinguish the precise nature of the existing affection, and fix its character, extent, &c.

" III. The Physical examination, as hitherto practised, seldom enables us to ascertain accurately the organic condition of more than the cervix and lower part of the body of the Uterus.

" IV. It is possible, by the use of a Uterine Sound or Bougie introduced into the uterine cavity, to ascertain the exact position and direction of the body and fundus of the organ—to bring these higher parts of the uterus, in most instances, within the reach of tactile examination, and to ascertain various important circumstances regarding the os, cavity, lining membrane, and walls of the viscus."

The second section opens with a description of the sound and mode of using it; and then we have the following propositions with full illustrations, part of which we shall also quote:—

" USES OF UTERINE SOUND.

" I. The Sound increases to a great degree our power of making a perfect and precise tactile examination of the Fundus, Body, and Cervix of the Uterus.

" II. The previous introduction of the Sound facilitates and simplifies the subsequent Visual examination of the Cervix Uteri with the speculum.

" III. By the use of the Uterine Sound we may, in many instances of

Pelvic and Hypogastric or Abdominal Tumours, ascertain the con-
nexion or non-connexion of these Tumours with the Uterus.

" We have already seen the advantages of having the uterus fixed
upon the bougie in facilitating the tactile examination of the outer
surface of the organ. This use of the sound is of still greater importance,
when a chronic pelvic or hypogastric tumour is present, and we wish to
ascertain whether this additional structure has its origin in, or any
connexion with, the tissues of the uterus, or is attached to some of the
neighbouring parts or organs. The power of making such a distinction
leads, in some instances, to practical distinctions in the treatment, and in
almost all cases to differences with regard to our opinion of the future
progress of the disease. The prognosis, for example, is very different in
ovarian dropsy, and in enlargement of the uterus from the presence of a
large mass of fibrous tumours in its walls. I have found, however,
no mistake to be more common in practice, than to suppose a tumour in
the hypogastric or iliac region to be an enlarged and dropsical ovary,
when it actually consisted of the other much less formidable disease of a
great mass of fibrous tumours in the uterine structures. When these
fibrous tumours 'attain,' to quote the words of Dr. Lee, 'a large size,
and come to occupy a great part of the abdominal cavity, they produce all
the injurious consequences of enlarged ovaria, from which indeed, during
life, they are distinguished with the greatest difficulty.'ᵃ 'It is often,'
says Dr. Ashwell, 'exceedingly difficult, where a growth, occupying the
abdominal cavity, is large, filling perhaps its greater portion, to determine
whether the uterus or ovary, or both, may not be diseased.'ᵇ This
difficulty is, in some cases, more or less removed by the evidence afforded
by the use of the uterine sound.

" When the tumour which is present is uterine, and consists of either
some general or partial enlargement of that organ, I have usually been
able to gain satisfactory evidence of the fact by the bougie, when passed
into the uterine cavity, entering, as it were, more or less directly into the
very structure of the morbid mass, and by the tumour and instrument
afterwards reciprocally moving in exact correspondence with all the
possible motions imparted respectively to each of them.

" In other instances, where the tumour is *not* uterine, I have repeatedly
made myself and others certain of the fact, by first introducing the
bougie, and so far giving us at once a knowledge of the exact position of
the uterus, and a control over its movements, and then proceeding in one
of three ways:—1. The uterus may be retained in its situation with the
bougie, and then, by the assistance of the hand above the pubes, or by
some fingers in the vagina, the tumour, if unattached to the uterine

---

ᵃ Cyclopædia of Medicine, Vol. iv., p. 388.
ᵇ Practical Treatise on the Diseases peculiar to Women, Part ii., p. 291.

tissues, may be moved away from the fixed uterus. 2. The tumour being left in its situation, it may be possible to move away the uterus from it to such a degree as to show them to be unconnected. Or, 3. Instead of keeping the uterus fixed and moving the tumour—or fixing the tumour and moving the uterus—both may be moved simultaneously, the uterus by the bougie, and the tumour by the hand or fingers, to opposite sides of the pelvis, to such an extent as to give still more conclusive evidence of the same fact. In a case, for example, which I saw during the last winter, there were two distinct, firm, defined tumours to be felt at the brim of the pelvis when the hand was placed above the pubes. The smaller of these tumours was placed to the left, and somewhat anterior to the other. The two tumours lay so close as to seem to be connected with each other, and this, with their semi-globular form, impressed the physician who had charge of the case with the belief that his patient had one of those masses of roundish fibrous growths affixed to the uterine walls that I have already spoken of as not unfrequently met with in this part of the body. The hypogastric examination of the swelling induced me at first to adopt the same opinion, but the employment of the bougie readily showed us to be both in error. The instrument, when introduced through the os into the uterine cavity, passed directly upwards to the top of that tumour which lay towards the left side, and the apex of the sound could be felt through the intervening tissues, at once demonstrating that this apparent tumour was formed by the fundus of the somewhat enlarged and displaced uterus. Retaining the instrument in this position, the uterus was next moved by means of the bougie still farther to the left, whilst the other tumour was at the same time pushed still farther to the right or opposite side, by the pressure of the hand, with such ease and to such an extent as to prove that it had no immediate organic connexion with the uterus. The farther examination of the tumour on the right side—its rounded form and other physical characters—its position behind the broad ligament, &c.—showed it to be ovarian. Without, however, the aid of the bougie, the two hypogastric swellings in this case would assuredly have passed for uterine fibrous tumours, instead of the one being formed by the fundus of the uterus, and the other by an enlarged ovary.

" The rules of diagnosis which I have been stating, evidently apply only to those cases in which the uterus and pelvic or hypogastric tumour are neither organically adherent to each other, nor so closely wedged together as to render them mutually immovable. But it often happens that, in consequence of the existence of one or more of these last-mentioned conditions, none of the tests that I have just now spoken of can be applied, and in such instances the bougie affords no very affirmative evidence. Still, however, the knowledge which we can gain by it, and by it alone, of the state of the uterine cavity, of the increased

or diminished length of that cavity, and especially of its relative *situation* and direction in regard to the existing morbid mass, are calculated in some of these more difficult and complicated instances to afford no small degree of assistance in the diagnosis.

" In one common set of cases, the knowledge of the exact situation of the uterine cavity, and hence of the uterus itself, in relation to the tumour that is present, even when both were immobile, has in repeated instances appeared to me especially important. The ovary normally lies behind the uterus, being attached to the *posterior* surface of the broad ligament. If, therefore, in a case of chronic tumour situated in the pelvis, the sound shows the tumour to lie on the *anterior* surface of the uterus; or, in other words, if the uterine cavity runs up the posterior surface of the morbid mass, the disease may be considered as certainly not ovarian, and the further difficulties of the diagnosis will thus be so far very much simplified by way of exclusion. This remark particularly applies to those cases in which the tumour, of whatever nature it may be, is still not so large as to have passed out of the pelvic cavity and become abdominal.

" I have found, however, advantage from the negative information given in other ways by the bougie, even when the tumour was abdominal in its seat. An example will best illustrate my meaning. In a case sent to Edinburgh a few months ago, for the purpose of having some opinion given in regard to its nature, an immense abdominal swelling that was present, and which had been supposed by some medical gentlemen, who had seen the patient, to be ovarian, was shown not to be so, by sufficient evidence of the following nature. The uterus was displaced obliquely backwords, and the fundus of the bladder was displaced towards the right iliac region by the abdominal enlargement—circumstances which were easily ascertained by introducing the uterine sound into the cavities of both of these organs. Further, the uterus, though displaced, was quite mobile; and when its fundus was turned by the bougie towards the site of either ovary, and the abdominal tumour lifted at the same time as high as possible towards the epigastrium, no obstruction was met with, nor was this great change upwards in the direction of the tumour found to produce *any dragging effects whatever* upon the uterus as held by the bougie, or upon its connexions—effects which, unless under the improbable supposition of a pedicle several inches long, would have inevitably occurred if the diseased mass had originated in or was connected with the ovaries or uterine appendages. So far, the evidence was negative, but still, nevertheless, important. I may add, that there characters of a more positive nature—the history, particular form and consistence of the tumour—its position in front of the intestines as ascertained by percussion, &c., &c.—seemed to show it, seeing that it was not ovarian, to be in all probability one of those hydatigenous

tumours that sometimes form in the tissue of the omentum, and whose physical symptoms during life in many respects correspond with those of ovarian dropsy.

" In a case, in which a very large hard and solid tumour was situated in the mesial line of the abdomen, and had been growing for years, the aid of the uterine bougie assisted us greatly in making a diagnosis of its pathological seat and character, by a kind of evidence which was exactly the reverse of that stated in the preceding instance. In the case we speak of, the os uteri was in its usual situation in the pelvis ; the bougie, however, after passing through it, glided onwards, obliquely forwards, and towards the left, showing the body of the uterus to be displaced in that direction. Farther, it was ascertained, by moving the bougie in the uterine cavity, that the progress of the uterus towards the right side was entirely prevented by the presence of the opposing morbid mass, whilst it could be moved to the left side to a slight extent, but still so much so as to show that its surface was not *immediately* adherent to the tumour. Holding the bougie in the uterus, with a finger in contact with the cervix uteri, the body of the growth was next strongly pushed both upwards and to the right, with the other hand placed upon the lower part of the abdomen. When so moved, the tumour distinctly pulled upwards along with it the uterine bougie, and consequently the uterus itself. The whole examination by the bougie thus showed :—that, *first*, The tumour was not a fibrous growth developed in the uterine structure, or intimately attached to its exterior surface, because the body of the uterus, though displaced by the presence of the growth, was still movable to a certain degree independently of it ; *secondly*, It was probably an enlarged ovary, or tumour connected with the ovary or uterine appendages, because, when moved upwards or to the right, it dragged the uterus along with it ; *thirdly*, Though mesial in its position, it was attached to the side of the right ovary, or to the posterior surface of the right broad ligament, because the body and fundus of the uterus were displaced forwards and towards the left, and had some remaining mobility in that direction, but could not be moved by the bougie in any degree backwards, or towards the right side, in consequence of the presence of the opposing mass of the tumour. These circumstancs in the physical diagnosis of the tumour, as ascertained by the bougie, were confirmed by the other symptoms of the case; but these other symptoms would certainly, in consequence of the equivocal character and position of the tumour, have been in themselves insufficient to have fixed its true pathological seat and character.

" In the preceding remarks, I have pointed out the uses of the uterine bougie, in so far as they aid our examination of the *exterior* of the uterus, or of the outer surface of the Fundus, Body, and Cervix, and enable us to distinguish between tumours of the uterus itself, and those situated in structures altogether external to it.

" In continuing the subject in my next communication, I shall attempt
to state the still more important uses to which the instrument can be put,
in examining the *interior* of the organ, and the state of its walls, and in
determining the presence of those common but hitherto little known
forms of displacement that pass under the names of retroflexion, &c.   I
shall take the same opportunity of showing the circumstances which
counter-indicate the use of the sound, and the cautions required in its
employment."

The third and fourth sections are on the measurement of the
cavity of the uterus as a means of diagnosis in some of the morbid
states of that organ.   In the first of these the conditions are
described under which the uterine cavity is elongated, and in the
other the circumstances under which it is shortened.   It may
be shown by the sound that there is morbid permanence of the
state of puerperal hypertrophy, and by it the condition of the
uterus, as a sign of recent delivery, may be ascertained so as
to enable us to decide with certainty when it is imputed that
recent pregnancy has either been concealed or feigned.   But impor-
tant as is the information to be obtained by the measurement of the
uterus by means of the sound in these cases, that to be obtained in
certain pathological conditions is still more so.   Thus the length
of the body is increased in cases of metritis and congestion, and in
other cases the cervix may be shown to have undergone a
longitudinal hypertrophy.   But in cases of fibrous tumours and
polypus, the measurement of the uterus is more valuable still, and
in that rare form of displacement where the uterus forms a part of
a hernial tumour, the elongation of the cavity is generally very
marked, and this with the direction the sound takes in passing, and
the feeling of its point in the tumour is really the only mode of
reliable diagnosis.

Preternatural shortness of the uterus may arise from original
malformation, or from stricture, or partial obliteration, which may
be ascertained by measurement with the sound, combined with
a hypogastric and rectal examination, and in partial inversion of the
uterus, a condition that often has been mistaken for polypus, and for
which polypus has also been mistaken, mistakes involving the life
and comfort of the patients, the measurement of the uterine canal
affords the best means of diagnosis.

Many illustrations are given of the uses of the sound under these
several heads, constituting the memoir, in fact a treatise on the
diagnosis of uterine disease, and in many other memoirs as in that

on retroversion of the unimpregnated uterus, the use of the sound is still further shown, but it is not necessary for us to go further. We have said enough to show that if it were for the memoir on the sound alone, Simpson's name must live for ever. He was a man of great breadth of intellect, of great power and great enthusiasm. One of those men who take the age by storm, and compel it to advance with rapid progress; it may, it is true, be sometimes necessary with such men to re-examine the ground gone over, and thus men of little minds get an opportunity of carping; men whose field of vision is so limited that they can only see details— as those who look through the microscope—magnified, and who, on detecting some trivial inexactitude, proclaim, with self-inflated importance, that the master has committed an error, which they, in their superior wisdom, have detected. We have seen a little dog bark and snarl at a caged lion; and we have read criticisms on the works of great men, that have reminded us of the occurrence.

Lectures on Obstetric Operations, including the Treatment of Hæmorrhage, and forming a Guide to the Management of difficult Labour. By Robert Barnes, M.D., F.R.C.P., &c. Second Edition, revised and extended. London: Churchill. 1871. 8vo, pp. 508.

The appearance of a second edition of these lectures within the short period of fourteen months, abundantly confirms the very favourable opinion we expressed in reviewing the first issue. In the preface it is stated that, apart from a few necessary corrections, the present book is a reproduction of the first, adding, however, several important topics which called for discussion in a work on obstetric operations. We cannot well say more in the praise of this book than we have already done; we look on it as one that no man who practises the obstetric art can afford to be without, and we are glad to find that a second edition has been so quickly called for.

Amongst the new topics introduced, are prolapse of the umbilical cord; asphyxia of the new born child; artificial respiration, retroversion, and retroflexion of the gravid womb; prolapsus and hypertrophic elongation of the uterus in pregnancy and labour; the complication of pregnancy and labour with tumours, extra-uterine gestation, condylomata, and retro-uterine hematocele; the chief deformities of the skeleton causing dystocia, including the rachitic, osteomalacic, spondylolisthetic, kyphotic and obliquely-ovate pelves; and rupture of the uterus, vagina, and perineum.

On the Use of the Ophthalmoscope in Diseases of the Nervous System and of the Kidneys; also in certain other General Disorders. By THOMAS CLIFFORD ALLBUTT, M.A., M.D., Cantab.; Fellow of the Linnean Society; Fellow of the Society of Antiquarians; Fellow of the Royal Medical and Chirurgical Society; Physician to the Leeds General Infirmary; and Lecturer in Practice of Medicine, &c., &c.   London and New York: Macmillan & Co., 1871.

THE oft-repeated and well known assertion that medicine is but an empirical science has lost a great part of its force in the present day; the art of recognizing disease is daily becoming more perfect, and the more accurate diagnosis becomes the more closely allied to the exact science does medicine in general become. Accuracy of diagnosis can, however, only be obtained by the additional help of chemistry and instrumental aid; and one of the great triumphs of modern times is the application of old or the introduction of new instruments for the purposes of detecting diseased processes otherwise inappreciable to our unassisted senses.   Amongst more modern instruments none has produced a greater revolution than the ophthalmoscope— an instrument which enables us to watch in the living eye one of the great nerves of sense, the wonderful circulation of the blood, the processes of health and disease.

The ophthalmoscope, as might naturally be supposed, was and is still principally employed by the special practitioner who makes the organs of vision his particular study, but its employment revealed to him processes and changes the cause for which he had to seek, perhaps, in some distant organ, as the kidney, or in the contiguous brain; the instrument led him in fact into the province appertaining, in the present subdivision of the profession, more immediately to the physician; thus the oculist has not unfrequently been the first to detect the existence of cerebral or renal disturbance. Dr. Allbutt in the work heading this notice most warmly and courteously acknowledges the physician's indebtedness to the oculist, and alludes to the "medical" character of many ophthalmic works and writings; in this we thoroughly concur, and with reason, for we believe no one can rise to eminence as an oculist who is not a good physician, as well as a practical surgeon.   Considering the great advances made recently in the study of nervous disorders, and that by means of the ophthalmoscope one of the great nervous

structures is laid bare to our view, we cannot but wonder that the studious physician has not made more use of the instrument. Dr. Hughlings Jackson was, we believe, one of the first physicians in Great Britain to call special attention to the connexion between nervous disorders and the state of the eye, and both he and, subsequently, Dr. Ogle have published most valuable practical papers on this subject in the various medical journals; the principal essays referring to this subject are to be found in the *Ophthalmic Hospital Reports*, the *Ophthalmic Review*, and Gräfes' *Archiv.*; such scattered essays are, however, not always accessible, and it is, therefore, if even for no other reason, we hail with satisfaction the appearance of such a monogram as Dr. Allbutt's, which consists of several of his previously published essays, together with much new material written up to the present state of knowledge. We much regret that time and space will not allow us to do more than allude to the objects of this classic work, and briefly refer to the contents of some of its chapters. The author's object is to bring to the practical physician's assistance another physical means of diagnosis, and to point out and explain those ocular conditions which are so frequently found associated with diseased intracranial processes or morbid conditions elsewhere, to establish, by means of the ophthalmoscope and microscope, the modes and the relations of the connexion between cerebral and visual disorders for the purposes of insight into the ways of nervous disorders in general. To all physicians or ophthalmoscopists who desire to follow in Dr. Allbutt's footsteps we would recommend a most careful study of chapter IV., which deals with the variations from health of the optic nerve and retina, especially of that most valuable portion treating of the distinction between optic neuritis and choked or gorged optic disc— ischaemia or stauungs papilla of the Germans; it is of primary importance to discriminate this venous congestion of the disc from inflammation of the nerve, for while the former generally denotes intracranial tumours, hydrocephalus, or meningitis, the latter points to encephalitis and meningitis. In this chapter the author proposes to call chronic optic neuritis "red softening." The author admits that local and uncomplicated optic neuritis may occur, but considers it very rare, and says that "the occurrence of papillary ischæmia or of optic neuritis in any person ought to awaken the gravest suspicion of cerebral disorder, and the occurrence of simple atrophy should suggest great watchfulness."

A large portion of the work is devoted to the discussion of the

effects upon the optic disc or retina of the following forms of encephalic disease:—epilepsy, chorea, mania, dementia, meningitis, concussion and fracture, hydrocephalus, tumour, and periostitis chronica, atheroma, softening and hæmorrhage, cerebritis, abscess and sclerosis, general paralysis. Some of the observations and conclusions are highly interesting, as well as novel. One of the author's achievements, which has excited our admiration, was the examination and observation of the optic discs in a raving maniac. The ophthalmoscope is used as a means of diagnosis in the investigation of insanity, chiefly for the distinction of " organic" from " functional " disease.

He believes that epileptic convulsions " may accompany venous hyperæmia of the brain, as well as anæmia, both conditions being suppressions of arterial supply." With respect to the value of the ophthalmoscope in tubercular meningitis, Dr. Allbutt says—

" It enables us to learn something more concerning the clinical history of meningitis than we know already ; and this additional knowledge will bring about some change in our views and opinions concerning the frequency and the curability of this formidable disease."

And again—

" The important question for us to decide is, whether we have any means of detecting, with certainty, the presence of meningitis in those slighter cases where we can now only guess at it, or can scarcely guess, and in which cases we need not expect to find a large percentage of mortality. It is here, I think, that the ophthalmoscope comes to our assistance, and gives us the same kind of help in detecting incipient or slight degrees of tubercular meningitis that the stethoscope gives us in detecting those incipient or slight degrees of ulcerative changes in the lungs, which, without it, are beyond certain diagnosis. When a patient is seized with vomiting, headache, convulsions, and other symptoms of much meningitis, and when, at the same time, on examination with the ophthalmoscope, I find congestion of the optic disc and retinal vessels, which is frequently the case, then I have no hesitation in saying, that the patient is suffering from meningitis at the base of the brain, and the autopsy proves the diagnosis to be correct."

He is also of opinion that meningitis of a mild form is of much more frequent occurrence than physicians generally suppose, and that the patients recover, but with adhesions and thickening of the meninges, and refers to the cases of idiots in whose eyes he has seen changes suggestive of past meningitis.

In intracranial tumours also the ophthalmoscope yields important evidence, and although it may not inform us of the nature of the tumour, but only of changed physical conditions, it shows at some time or other in the course of almost all cases of intracranial tumour changes of a congestive, neuritic, or atrophic character; the diagnosis in a case of this kind is therefore incomplete unless the eye-mirror has been carefully and repeatedly used. There is no doubt but that changes will be found in the optic disc if looked for in almost all cases of intracranial tumour, and very many other intracranial diseases, but there is a difference of opinion respecting the explanation of such changes. In a late number of this journal we alluded at some length to this subject, and brought Professor Wharton Jones' views before our readers: he, Benedikt, and others hold the optic nerves and their vascular supply to be specially under the control of the sympathetic nerve, and argue that the changes in the optic nerve revealed by the ophthalmoscope or dissection are due to sympathetic vaso-motor disturbances. Dr. Clifford Allbutt, on the contrary, holds that the changes in the disc are due to intracranial pressure, to hyperæmia multiplied at the sclerotic ring, and to the travelling downwards of irritative action; he gives a full, fair, and impartial statement of Benedikt's views. In order to know what symptoms follow the growth of a tumour in any portion of the intracranial cavity he enumerates and discusses tumours occurring in sixteen localities, viz., tumours of the convex surface, whole hemisphere, anterior lobe, middle lobe, posterior lobe, corpus callosum, corpus striatum, and optic thalamus, crus cerebri, cerebellum, crura cerebelli, corpora quadrigemina, pons varoli, medulla oblongata, anterior or ethmoïdo-frontal fossa, middle fossa, posterior or cerebellar fossa.

It is right to mention here that Dr. Allbutt, with that candour which characterizes every true philosopher, confesses that he is—

"Not in a position even to indicate, with anything like finality, the actual value of the presence or absence of optic change in the diagnosis or exclusion of encephalic tumour; nor am I able to say, with anything like certainty, what are the intermediate processes which connect these changes in the head with inflammatory or congestive changes in the discs. I must content myself with the humbler task of revising and setting forth the facts, as they seem to have been made out by myself and others, and must still look forward to the time when these facts shall be comprehended in some more general laws."

In the chapter on diseases and injuries of the spine the author again reverts to the interesting question as to the channel through which the spinal irritation is propagated to the eye, and concludes that the hyperæmia in the back of the eye depends on a direct extension of the meningeal and vascular spinal irritation up to the base of the brain. His researches and experience have led him to conclude—(1) that changes at the back of the eye do not infrequently follow spinal disease; (2) that these changes do not become established in the cases which run a short course, but they slowly supervene in the course of weeks or months in more chronic cases; (3) that in spinal disease, arising from injury, the higher the seat of the injury, the sooner are there changes in the eye.

The chapter on albuminuric retinitis abounds with information; it is in our opinion the best exposition we are acquainted with of the state of the eye in Bright's disease, and throws much light upon this particular disease, in its relations not merely to the eye, but to the system in general. The author, after describing the characteristic appearances of retinitis albuminurica, and discussing most ably its pathology, proceeds to inquire into the connexion between the nephritic and the retinal changes. He is of opinion that some one or more of the constituents of urine can, when left in the blood, so irritate delicate tissues, as to set up mischief such as we find in the retina; but he confesses to the difficulties of this theory, when it is considered that the retinitis sometimes precedes all other obtrusive symptoms and any signs of uræmia, and that, again, uræmia often exists without ocular trouble. The hæmorrhage he explains by the blood, impoverished by loss of its albumen, tending to exude from the vessels. He also brings prominently forward a fact, not very widely known, that, in Bright's disease, there occur two forms of eye troubles—one in which impaired vision or blindness occurs without any visible retinal changes, and the other in which certain visible degenerations occur in the eye.

Leukæmic retinitis which, like albuminuric retinitis, is a " combination of hæmorrhagic with irritative events," also engages Dr. Allbutt's attention, but, as he confesses, without any satisfactory results as to the mode and causation of these events; they both occur, he says, in conditions in which uric products are found in excess; in leukæmic retinitis, urea, and uric acid are found in excess; in albuminuric retinitis they are insufficiently excreted.

In the chapter on toxic amauroses some very interesting conclusions of Mr. Aldridge are communicated respecting the

appearances seen in the nervous apparatus of the eye and its circu-
lation, after the administration of bromide of potassium, ergot,
chloral, nitrate of amyl, and nitrous oxide gas. Syphilitic retinitis,
diabetic amaurosis, embolism of the central artery of the retina,
amaurosis of oxaluria, also occupy the author's attention, as well as
the effect of disorders of the menstrual and other secretions upon
the optic nerve and retina, and one of the most valuable portions
of the work consists in the appendix of cases. The value of this
appendix is greatly enhanced by the fact that few cases depending
upon an autopsy are included, unless an autopsy was obtained.

Amongst other interesting questions started and discussed is the
case of blows on the head, determining the occurrence of intra-
cranial syphilis ; another is the remarkable fact that in almost all
cases of general paralysis, there is a tendency to atrophy of the
optic disc. The following remarks, respecting apoplectics, deserve
the physician's gravest attention :—

" The frequent concurrence of albuminuric retinitis and encephalic
hæmorrhage in the same person is, however, reason enough to urge us
to examine the retina in all cases of encephalic hæmorrhage. The
discovery of retinitis or its traces should make us give a far graver
opinion than in a case where there was no degeneration of the kidney,
and a somewhat graver diagnosis than in cases where albumen in the
urine existed without retinitis. It may be the chances of individual
experience which lead me to say this ; but it has certainly happened to
me very often to see retinitis in apoplectics who have been rapidly cut
off by a second attack ; while others, having albuminuria, but not
retinitis, have survived much longer. I may extend this remark further,
and say, that I believe a person who has not suffered from apoplexy, but
has retinitis, is in great danger."

We conceive that Dr. Allbutt has conclusively shown that the
ophthalmoscope should be employed by every physician who desires
to make himself thoroughly acquainted with diseases of the nervous
system ; we would, however, with Dr. Allbutt, impress upon him
the advisability of employing the instrument at an early period of
the supposed malady, and not to wait until the patient complains
of loss of vision. No inferences can be based as to the state of the
optic disc upon the degree of vision. We have seen choked disc
as well as neuritis where the patient had not complained of impaired
vision.

It might, perhaps, be inferred, from our brief remarks, that

Dr. Allbutt relies too much on the use of the ophthalmoscope; but this is not the case. He is no enthusiastic dreamer, who has taken up a hobby and rides it to death. His work shows him to be a sound, practical philosopher, looking at his subject from every side with the view of arriving at truth and elucidating some of nature's most profound mysteries. At the end of the chapter on tumours he says that—

"The occurrence of optic signs is so uncertain that the ophthalmoscope will give no encouragement to the practitioner who takes to it in the hope of making careful thought and quick sense unnecessary. On the other hand, its revelations, in many cases, are of the greatest value and importance, and in some may even determine a diagnosis. If the subject is to be followed up, it must be by the addition of large numbers of carefully observed autopsies, by the avoidance of those reckless assertions of the certainty of ophthalmoscopic indications in which too many writers have indulged, and by the avoidance, also, of such smooth phrases as ' the propagation of irritation by a foreign body in the brain along the course of the opic nerve,' and the like. There is little evidence that tumours do propagate ' irritation' in this way, and my own pathological observations seem rather to prove the contrary. I have not argued, in the preceding section, from any cases, however clear they seemed to be, in which I failed to obtain autopsy; and I hope that, in all future examinations, especial attention will be given to the state of the nerve matter surrounding the tumour. Softening and pressure I have found, but not extensive proliferation strolling along devious tracts. There is no mysterious liability in the optic nerves to symptomatic changes which is not possessed in a degree by all others, the frequent affection of the optic nerve being due simply to its greater extent in the cranium, to its richness in vascular and connective tissue, and to the size and position of its centres."

Dr. Clifford Allbutt's work must take a high rank among the original books of the day. It is characterized not only by the importance of its matter but by the clearness and vigour of its language. Its pages are enriched by two chromo-lithographic plates; that on the frontispiece is the admirable picture, painted by Dr. Fitzgerald, which appeared in this journal in February last.

Die " Exacten" Deutschen Ohrenärzte. Von Dr. W. KRAMER, Geheimer Saintätsrath. Berlin. 1871.

The " Exact" German Aurists. Pp. 38.

THE principal portion of this pamphlet consists of a most undignified and ill-tempered attack on the German aurists of the

present day, and the remainder is devoted to self-glorification and the author's discovery of the beneficial effects of the finest olive oil and atropine solution in cases of tinnitus aurium. These therapeutical agents can, however, the author states, be introduced into the Eustachian tube only by means of his silver catheter No. 1. The learned doctor's wrath seems to have been drawn down chiefly by the fact of his German contemporaries having followed in the footsteps of the late Mr. Toynbee, who even in his grave is not safe from Dr. Kramer's invective; for at p. 9 he says that Toynbee was nothing more than a mere anatomist, and that he had not the slightest claim to be considered an aurist.

The West Riding Lunatic Asylum Medical Reports. Edited by J. Crichton Browne, M.D., F.R.S.E. Vol. I. London: J. and A. Churchill. 1871. 8vo, pp. 265.

We are very glad to find that a volume of Reports similar to the one now before us will be issued annually. In the present the reader will find abundant proof that, notwithstanding the onerous duties of management imposed on the medical superintendents of English Asylums, they find time for scientific work. The first paper in the present volume is by the editor, Dr. J. Crichton Browne, the Medical Director of the West Riding Asylum, and the Lecturer on Mental Diseases at the Leeds School of Medicine. It is on Cranial Injuries and Mental Diseases. One portion of it possesses special interest for obstetricians, as it treats of the mental defects due to cranial injuries sustained during tedious and instrumental labours; and the whole communication deserves careful perusal by medical jurists, and by physicians engaged in the investigation and treatment of insanity.

The other papers are as follows:—Observations on the Physiological Action of Nitrous Oxide, by Samuel Mitchell, M.D.; The Sphygmograph in Lunatic Asylum Practice, by George Thompson, L.R.C.P., Lond.; The Ophthalmoscope in Mental and Cerebral Diseases, by Charles Aldridge, L.R.C.P., Lond.; A Contribution to the Statistics of General Paralysis, by J. Wilkie Burman, M.B.; On the Treatment of Insanity by the Hypodermic Injection of Morphia, by J. Bywater Ward, B.A., M.B.; On Mollites Ossium and Allied Diseases, by George Henry Pedler, L.R.C.P., Lond.; On Locomotor Ataxy at some other forms of Locomotor Deficiency as found in the Insane, by Patrick Nicol, M.A., M.B.; On the

Artificial Feeding of the Insane, by William Lawrence, M.B.;
Arachnoid Cysts, by Henry Sutherland, M.A., M.B.; Phthisis
and Insanity, by Patrick Nicol, M.A., M.B., and W. Watson
Dove, L.R.C.P.E., M.R.C.S.; Acute Delirious Melancholia, by
Charles Henry Mayhew, L.R.C.P., Lond., M.R.C.S.; Ergot of
Rye in the Treatment of Mental Diseases, by E. Churchill Fox,
M.B., C.M.

None of these can we at present notice, but it will be seen from
their character that they are all on subjects specially worthy of the
attention of asylum physicians, who should feel much indebted to
Dr. Browne for the publication of so many important papers.

Notizen und Erinnerungen eines Ambulanz-Chirurgen. Von
WILLIAM MAC CORMAC, Wundarzt am St. Thomas-Hospitale
in London, früherem consultirenden Chirurgen des allgemeinen
Krankenhauses von Belfast und Senatsmitgliede der Königlichen
Universität daselbst. Aus dem Englishen Übersetzt und mit
Bemerkungen Versehen. Von Dr. LOUIS STROMEYER, Ver-
fasser der Maximen der Kriegsheilkunst. Hanover: Hahn'sche
Hofbuchhandlung. 1871.

THE work before us is a translation by the well known German
surgeon, Professor Stromeyer, of Mr. Mac Cormac's " Work done
under the Red Cross." We had occasion very favourably to notice
the original, but no commendation we could give could possibly
carry the weight which Stromeyer's approval carries—an eminent
surgeon, working in the same field, and familiar with the numerous
records of experience in the war which have been contributed by
German surgeons, he has, nevertheless, thought it desirable to
reproduce the record of Mac Cormac's experience. In the preface
he bestows upon our distinguished countryman the highest praise,
and wishes him, in his new sphere in St. Thomas's Hospital, every
success—a wish we heartily echo.

---

*On the Physiological Effects of Severe and Protracted Muscular
Exercise.* By AUSTIN FLINT, Jun., M.D., &c. New York:
Appleton & Co. 1871. Pp. 91.

THIS book contains the particulars of experiments made with a
pedestrian who walked $317\frac{1}{2}$ miles in five days—with the view of
ascertaining whether the muscular tissues, or the fatty tissues, of
the body supply the motive power by which work is done. Fick,

Wislicenus, Haughton, Voit, and others, maintain that there is no increased nitrogen in the urine during exertion; whilst Liebig contends that it is the nitrogenous substance of the body which furnishes, by its decay, the animal motive power. Dr. Flint's results support, on the whole, the Liebigian theory; but then it must be considered that they were obtained under very extraordinary circumstances. We commend this valuable memoir to all who are interested in the subject of physiology in relation to the sources of animal motive power.

WORKS ON CHEMICAL AND PHYSICAL SCIENCE.

1. *A Manual of Chemical Analysis, Qualitative and Quantitative, for the Use of Students.* Part I. Qualitative. By H. M. NOAD, Ph.D., F.R.S., &c. Fourth Edition. London: Reeve & Co. 1870. Pp. 226.

2. *Select Methods of Chemical Analysis.* By WILLIAM CROOKES, F.R.S., Editor of the *Chemical News, &c.* London: Longmans, Green, & Co. Pp. 468.

3. *Lessons in Elementary Physics.* By BALFOUR STEWART, LL.D., F.R.S., Professor of Natural Philosophy, Owen's College, Manchester. London: Macmillan. 1870. Pp. 372.

4. *Researches on Diamagnetism and Magne-crystalline Action.* By JOHN TYNDALL, LL.D., F.R.S., Professor of Natural Philosophy in the Royal Institution of Great Britain. London: Longmans, Green, & Co. 1870. Pp. 490.

5. *Notes of a Course of Nine Lectures on Light.* By JOHN TYNDALL, LL.D. London: Longmans & Co. 1870. Pp. 74.

6. *Notes of a Course of Seven Lectures on Electrical Phenomena.* By J. TYNDALL, LL.D., &c. London: Longmans & Co. Pp 40.

DR. NOAD has long enjoyed a well-deserved reputation as a scientific writer. His text-book on electricity is regarded by teachers of that science as one of the best standard works on that subject. His work on chemical analysis is no less esteemed by teachers of that branch of chemical science; and the fact that it has, in a comparatively short time, reached a fourth edition, is the most practical proof of the popularity of the work which could be given. The present edition (the Qualitative Part, is that to which we now refer) is much improved. Several new processes have been introduced, and the new notation and nomenclature have been adopted.

Mr. Crookes' " Select Methods of Analysis" is one of the most valuable additions to our works on practical chemistry which has for many years issued from the press. It consists of all the more important new and modified processes in analytical chemistry which have been from time to time published in the *Chemical News*—a journal which is edited by the author. These processes have been carefully considered, approved of, modified, and in most instances verified by Mr. Crookes; and they have been carefully arranged and placed under convenient heads. Every one who is in any way engaged in chemical analysis should provide himself with a copy of Mr. Crookes' invaluable work.

Dr. Stewart's " Lessons on Elementary Physics" constitute an admirable text-book for students. The plan of the work is new, and the doctrine of energy, which is now so prominently taught by scientists, is employed by the author to connect, as it were, the different branches of the physical sciences. The work exhibits, unmistakably, the care bestowed upon its production; and we can conscientiously recommend it as a students' book—though by no means solely adapted to their requirements.

Dr. Tyndall's lectures and works are of world-wide celebrity. Probably since the time when Sir Humphry Davy attracted crowds of titled personages of both sexes to listen to his eloquent lectures on chemistry, no one has lent a greater interest to the discourses delivered in the Royal Institution than Dr. Tyndall. He unites in himself the qualifications of a brilliant expounder of science and of a deep and original inquirer in the fields of original research—a combination very rare indeed. He is one of the few scientific men who have earned a great popularity amongst both the scientific and non-scientific sections of the public. A popular lecturer on science is, generally, not an original investigator, and is better known to the general public than to the scientific world. On the other hand, such great discoverers as the late Robert Brown are often only known to the cultivators of those sciences which they have enriched by their discoveries. Therefore, we say that Dr. Tyndall is one of the very few men who have acquired a solid and deserved reputation amongst both non-scientific and scientific persons. His works on magnetism, light, sound, heat, and electricity, have obtained as great a degree of favour as his lectures; and the simple and clear style in which they are written renders the information which they contain accessible to those who are but imperfectly acquainted with the physical sciences. The

works of Dr. Tyndall above-named, though, of course, of most interest to purely scientific men, might still be read with pleasure and profit by non-scientists. The lecture notes should be in the possession of every lecturer on physics.

WORKS ON DIET.

1. *A Handy Book on Food and Diet in Health and Disease.* By CHARLES A. CAMERON, Ph.D., M.D., Professor of Hygiene in the Royal College of Surgeons, Ireland, &c. London: Cassell, Petter, and Galpin. 1871. Pp. 96.

2. *On Diet and Regimen in Sickness and Health.* By HORACE DOBELL, M.D., &c. London: H. K. Lewis. 1870. Pp. 151.

3. *A Manual of Diet for the Invalid and Dyspeptic.* By DUNCAN TURNER, L.R.C.P.L. & R.C.S., Ed., &c. London: Churchill & Sons. 1869. Pp. 72.

THESE little works seem to us to fulfil very fully the objects for which they have been written, namely, the diffusion of a wider and more accurate knowledge of the principles of nutrition and of the nature of food amongst non-professional persons. They are all essentially works of the "popular" class, and we hope that the solid information which they contain will benefit the classes of persons for whose instruction they have been written.

Army Medical Department Report for the Year 1869. London: Her Majesty's Stationery Office. 1871. Pp. 672.

THIS huge volume, to which reference is made in the Report on Public Health, contains a vast amount of statistical information, and, like the preceding volumes, will always remain a work of reference, invaluable for many purposes. The present volume contains, in addition to the usual reports on the health of the troops at the different stations at home and abroad, twenty-six original articles on various subjects—most of them of general interest—by army medical and other officers. Brevet-Colonel Massy makes some excellent remarks (illustrated with several engravings) on the dresses of the British army, and points out several desirable improvements, whilst the dress of our soldiers in India forms the theme of a capital article by Assistant-Surgeon L. Corban,

21st Hussars. Dr. Balfour testifies to the advantages which have resulted to the army from the Contagious Diseases Act of 1866. Dr. Corban, in a paper on the " Etiology and Prevalence of Diseases of the Heart amongst Soldiers," shows that 6·133 men per 1,000 were yearly admitted from heart disease into hospital ; that the deaths amounted to 0·7 per 1,000; and the men invalided to 2·42 per 1,000 from these diseases. He attributes the cause of heart disease in the army to enlistments at too early an age, ill-adjustment of weights, and undue constriction of the body, from badly-made clothes, syphilis, intemperance, and, lastly, over-feeding in warm climates.

Amongst other interesting papers may be specially noticed two on " Ophthalmia," by Drs. A. L. Adams and Welch; on the " Necrometer," by Staff Assistant Surgeon Oughtan; " On the Bavarian Method of applying Plaster of Paris Splints," by Staff Assistant Surgeon Moffett; and " Observations on the Suspended Matters in the Air at the Royal Victoria Hospital, Netley," by Staff Surgeon Watson. The report on Hygiene, for 1870, contributed by Dr. Parkes, enhances the value of this important volume.

DISEASES OF CHILDREN.

We have in type a lengthened review of works on Diseases of Children, a number of books on this important subject having reached us during the past twelve months, some of them, particularly the Treatise by Drs. Meigs and Pepper, published by Lindsay and Blakiston, of Philadelphia, and the Translation of Vogel's Monograph, by Dr. Rapael, published by Appleton, of New York, are of special excellence, and cannot be passed without a full review ; and although we are very unwilling to do so, we must hold them over.

Dr. Churchill's Manual, however, demands no extended notice ; it is well known and highly esteemed both in Great Britain and in this country. It now appears as a third edition, in preparing which for publication its respected author has had the advantage of the assistance of his son, Dr. Fleetwood Churchill, jun., Physician to the Dispensary for Sick Children.

PART III.

QUARTERLY REPORTS.

———◆———

REPORT ON MEDICINE.[a]

By JAMES CUMING, M.A., M.D.; Professor of Theory and Practice of Medicine, Queen's College, Belfast; Physician to the Belfast General Hospital; Examiner in Medicine in the Queen's University in Ireland.

EXCRETION OF CARBONIC ACID IN FEVERS.

THIS important subject, which is of the highest pathological interest, has been investigated by Leyden.[b] The late Dr. Malcolm,[c] of Belfast, published some careful observations on typhus patients made with Prout's apparatus, from which it appeared that while the normal proportion of carbonic acid in expired air amounts to 3·96 per cent., in typhus the mean of 45 cases gave only 2·492 per cent.; while in one case the amount was as low as 1·18 per cent. This fact, which is directly contrary to the analogy of the excretion of the products of the waste of the nitrogenous tissues, has long puzzled observers, and has seemed an anomaly in the explanation of the febrile process. The excretion of urea and that of uric acid undergo a considerable increase, and, à priori, one would expect that with the constant and considerable increase of temperature which occurs in fever, the amount of carbonic acid produced would also be much above that of health. Senator[d] made some experiments on animals in whom a febrile condition had been artificially produced by him, and found that the amount of carbonic acid expired was diminished. Some doubt has been expressed regarding the accuracy of these observations, in consequence of the

<hr>

[a] The author of this Report, anxious that every contribution to Pathology and Practical Medicine should be noticed, will be glad to receive any publications on these subjects. If sent to correspondents of the Journal they will be forwarded.

[b] Deutsches Archiv für Klinische Medicin. Band vii., Heft 5 and 6.

[c] Edinburgh Med. Journal. 1843.

[d] Virchow's Archiv. Bd. 45.

manner in which they were taken, and more recent observers do not seem inclined to attach much importance to them.

Liebermeister,[a] one of the most zealous and successful investigators of the subject of fever, made some observations on the air expired by two patients suffering from intermittent fever, and states that he found the amount of carbonic acid expired notably increased during the febrile paroxysms.

It is manifest that the estimation of the total amount of the air which passes through the lungs in a given time must play an important part in inquiries of this kind, and that this in turn must be greatly influenced by the number of the respirations. It is known, as was shown by Vierordt, that with increased rapidity of respiration the percentage of carbonic acid in the expired air considerably diminished. Now in fever an increased frequency of respiration is a phenomenon of all but constant occurrence. This increased frequency does not seem to present any definite relation to the temperature, but appears to depend upon the concurrent action of various causes. It is quite conceivable, therefore, that while the percentage of carbonic acid present in any given quantity of the air expired from the lung in fever may be less than that contained in an equal quantity expired by a healthy person, the accelerated respiration, by increasing the total amount of air expired in the febrile case, may cause an actual increase in the absolute quantity of carbonic acid expired by the patient. This is what Leyden has actually found to occur. By employing what is known as Lossen's apparatus, with an improved mouthpiece, he was able to ascertain both the entire amount of air expired in a given time and the percentage of carbonic acid contained in it. He found that if the quantity of air expired during a given time by a patient in fever is represented by 3, that expired during health may be taken as 2. On the other hand, he corroborated Malcolm's results as to the decrease in the carbonic acid in a given quantity of air expired in fever, having found that it stood to the percentage contained in the expired air in health in the proportion of 3 to $3\frac{1}{3}$. But the final result of his experiments gave an absolute increase of carbonic acid in the proportion of nearly 3 to 2, excreted by the lungs in fever during a given time, when compared with the amount excreted in health.

These observations are entirely consonant with those which refer the causation of the increased temperature met with in fever to

[a] Deutsches Archiv. Bd. vii.

chemical action developed in the metamorphosis of tissue and of other materials in the body. Traube had put forward the extraordinary opinion that the elevation of temperature in febrile maladies did not depend on any increased production of heat, but on the fact that the body does not so readily part with its caloric. Leyden has shown by a series of carefully conducted calorimetric observations that more heat is given out by the body when under the influence of fever than in the state of health. He found this increase during the progress of the malady to reach from one and a half times to nearly double the normal amount, and at the period of crisis to arrive at almost three times the normal.

ON CHANGES IN MUSCLE DURING THE PROGRESS OF ACUTE GENERAL DISEASES.

A paper on this subject from the pen of Dr. George Hayem appears in the *Archives de Physiologie.* Under the name of Symptomatic Myositis, he describes certain lesions of the muscular system of an inflammatory character met with in acute affections, and seeming by their irregular seat, by their progress and their nature, to depend in some manner on the principal malady, during the course of which they show themselves. Since 1866 he had examined many of the muscles of the bodies of persons who had died of various diseases, but he only found acute muscular changes in fifty-two cases classed as follows:—

Small-pox, 22 cases in 24 autopsies.

Typhoid fever, 19 cases in 21 autopsies.

Scarlatina, 1 case in 1 autopsy.

Measles, 2 cases in 3 autopsies.

Acute general miliary tuberculosis, 3 cases in 3 autopsies.

Jaundice (severe), 1 case in 2 autopsies.

Erratic erysipelas with meningitis, 1 case for 1 autopsy.

Tubercular meningitis, 1 case in 2 autopsies.

Puerperal fever with metastatic abscess, 1 case for 1 autopsy.

Phlegmonous parotitis in a case of senile cachexia, 1 case for 1 autopsy.

In the pneumonias of different periods of life, in phthisis rapid or chronic, in the simple inflammatory affections, the cancerous, cardiac, and senile cachexias, his researches were attended with negative results.

Three degrees or successive phases of the muscular lesions are described.

The first degree is characterized by hyperæmia, by the commencement of the glassy and granular degeneration of the fibres, and sometimes a slight degree of alteration of the walls of the vessels. In this stage the altered muscles are almost always a little tumefied and hard; their colouration is brownish or deep red; their friability a little greater than in the normal state. In some points very irregularly distributed, and in a certain number of cases only may be observed a paleness and an anomalous fragility of the muscular bundles. The microscopic examination shows a congestion of the vessels extending to the finest capillaries, a swelling and irregularity of the muscular fibres, and sometimes a notable alteration of the striation, and a beginning of the granular or glassy degeneration. Generally in this stage the vessels and interstitial tissue are healthy.

The second degree is marked by the complete development of the glassy and granular degeneration of the striated contents of the muscular fibre, and a proliferation of cellular elements on the interior of the sarcolemma. The tumefaction of the muscle still persists, and in some bundles of fibres becomes extremely pronounced. It is especially remarkable when a muscle is affected in its whole thickness. The colour depends on the extent to which the muscle is implicated. Sometimes it presents a reddish yellow colour, resembling Spanish wax; sometimes it is of a rosy grey, and almost always there are notable differences in the bundles of the same muscle. The surface of a section made perpendicular to the direction of the fibres has often an appearance which calls to mind that of the cortical substance of the kidney in Bright's disease; it is finely granular, projecting, as if the swollen fibres were compressed by the interstitial tissue. In these circumstances the consistence of the muscular tissue is always altered. The hardness is still manifest, but the fragility is more considerable. Sometimes these characters may be wanting particularly in the granular form of degeneration. The histological modifications noted in this stage are:—In the granular form, an irregular deposition of fine granulations disposed in the direction of the longitudinal striation in the substance uniting the muscular fibrillæ, at first perhaps not sensibly altering the transparence of the fibres, but subsequently causing them to become more and more opaque. In the vitreous or glassy form, transformation of the contents of the fibre into masses, cylindrical, more or less voluminous, translucid, refracting light strongly, which generally distend in a limited

point the muscular fibre; disappearance of the striation of the glassy masses with some exceptions; existence here and there of irregular spaces; rupture of the fibrillæ producing a zig-zag striation; proliferation of the nuclei on the inner surface of the sarcolemma and between the fibrillæ by segmentation; sometimes a multiplication of the elements of the connective tissue, and a hyperplasia of the vascular walls.

The third degree comprehends, on the one hand, atrophy or complete disorganization of the degenerate fibres, and, on the other, the work of reparation or of regeneration, of which the end is to restore to the muscles their primitive structure. This degree relates almost exclusively to typhoid fever, not because this disease alone is capable of producing advanced muscular lesions, but because it permits the patient to live long enough. In this stage the hyperæmia and swelling of the muscles give place to a paleness, and anæmia often manifest, and, at the same time, to atrophy occasionally well marked. Sometimes the tissue is soft, pasty, friable; sometimes, on the contrary, it is dense, of a firmness and dryness greater than in the normal state, and the latter characters are often observed at the points most void of colour. Observations by the microscope lead the author to believe that the granular degeneration probably does not bring about a complete disappearance of the altered fibres, but this is a question which he cannot definitely solve. The last phases of the glassy degeneration are more easy to determine; the vitreous masses break up and disappear, and in the spaces appear proliferating nuclei, surrounded by a certain quantity of protoplasm. Of these, three distinct forms of new structure presented themselves. First, rounded elements, constituted by a granular protoplasmic mass, and one or two ovoid nuclei analogous to the normal muscular nuclei. Second, elements analogous but fusiform in shape. Third, in a more advanced stage bands with many nuclei. Very similar new formations are also described as being found in the cellular tissue around the fibres, and disposed in the direction of the vessels. Various authorities are cited on the question of the regeneration of muscular tissue, and he states that it appears to him well established, that the evolution of the muscular cellules within the sarcolemma leads, little by little, to the formation of elements elongated, irregular, in the form of bands with multiple nuclei, and that these elements are, in fact, young muscular fibres; but with regard to the similar formations in the cellular tissue, he believes

they give origin only to the accessory elements of the muscular tissue.

As to the seat of the muscular lesions, they may be found in a great number of muscles, but he believes that the muscles of the upper extremities, and those which surround the thorax, are less frequently affected than those of the abdominal walls and lower extremities, particularly the adductors of the thighs. The heart is also frequently affected. In the 19 cases of typhoid fever, above noted, this organ was altered in a notable manner 7 times, and lately he has been able to convince himself of the constancy of these alterations when the patients succumb during the period of defervescence. In the 22 cases of small-pox the heart was altered 9 times; and in the 3 cases of acute miliary tuberculosis once. The alterations in the striated fibres of the heart are analogous to those of the other muscles, offering, however, some peculiarities.

Dr. Hayem attributes to the pathological process in the muscular tissue the fatigue, general depression, and pain in the loins experienced by patients during the first days of typhoid fever. Muscular contraction becomes painful, and the standing posture troublesome or impossible, even when the patient is not notably enfeebled. Moderate pressure exercised upon certain muscles, particularly the adductors of the thighs, determines suffering more or less acute. It is during the first seven days of the fever—viz., when the fibres are congested and tumefied—that all these symptoms are best marked. Subsequently, when the fever has reached its acme, and the patients are prostrate, the muscular hyperæsthesia is less manifest.

He notes, also, tenderness on pressure in cases of small-pox as owing to the inflammation of the muscles, and attributes, as in typhoid, the prodromata to the same cause. The violent lumbar pain, however, he thinks, bears only remote relations with the muscular lesion, inasmuch as its appearance and subsidence are altogether abrupt.

The complications and sequelæ of the muscular lesion are—hæmorrhage, either in form of ecchymosis or fluctuating tumour, collections of pus, muscular feebleness, consecutive paralysis, contractions, spontaneous dislocations, trembling, and paresie of the tongue.

His observations confirm the researches of Lonis, Stokes and Friedreich upon softening of the heart in fevers, and he states that they establish in small-pox a correspondence between the cardiac

phenomena observed during life and the alterations of the heart found on *post-mortem* examination.

M. Huchard, of the Lariboisiere, communicated to the writer of the paper the results of his observations of the cardiac phenomena of small-pox patients placed in his charge. He never found cardiac complications in the varioloid; they were, on the contrary, almost the rule in the confluent forms. During the months of January and February, 1870, they were noted in a third of the cases of discrete or confluent variola. They almost always appeared at the beginning of the secondary fever, rarely during the dessication; they almost always got well. In the progress of these cardiac lesions he observed two periods. The first, always of short duration and sometimes absent, was marked by an excitement of the heart; the second by feebleness, indicated by dull cardiac sounds, by the precordial impulse becoming only slightly perceptible to the finger, and replaced often by a slight undulation, by irregular intermittent beats, by a pulse unequal, irregular, and feeble. At this second period appeared a souffle with the first sound. The patients who, in the confluent form, succumbed before the eleventh day, almost all died by the heart. He observed four rapid deaths at the seventh or eighth day, and in three of these cases the autopsies revealed the existence of a true cardiac ramollissement.

TUBERCULAR MENINGITIS.

Hitherto the pathological researches made in cases of tubercular meningitis have been mainly confined to the encephalon, and consequently the descriptions of that affection relate to the lesions found in that organ alone. The morbid appearances presented being generally to a degree and of a character sufficient to account for the uniformly fatal termination of the disease, inquirers rested satisfied, and omitted to examine the remainder of the nervous centres. The difficulty of the task, the time and labour necessary to examine minutely the various regions of the spinal cord in a large number of cases, the unpromising character of the investigations as regards the lessening of the mortality of the disease, have all, no doubt, contributed to this result. Even on a cursory investigation of the subject, it would seem anomalous that tubercle should be so restricted as regards the site of its development to the base of the cerebrum, and that it should not be found in other parts of the nervous centres. Moxon[a] has reported an instance of tubercle of the

[a] Transactions of Pathological Society of London, 1870, p. 12.

spinal dura mater in a case of tubercular meningitis; and recently we have, from Liouville,[a] a careful examination of the subject, which has led that observer to the conclusion that tubercular meningitis is usually a spinal as well as a cerebral affection.

For two years, during which Dr. Liouville's attention had been fixed upon this subject, the numerous cases of granular tubercular meningitis observed by him in children, adults, and persons advanced in life, did not, in a single instance, show the manifestation confined to the cerebral envelopes; in all there was a similar spinal affection; in all the cerebro-spinal form existed, although the predominance was sometimes considerable, either towards the envelopes of the brain or towards those of the spinal cord.

When the cord and its envelopes were removed by the ordinary method from the spinal canal, he could at once recognize deep injections all around the dura mater, as well as even in a greater degree upon its inner surface. On making the longitudinal section of the dura mater, and endeavouring to turn to the side the two flaps resulting, the multiplicity of little vessels, gorged with blood, and in some points forming irregular sinuous figures, were at once observed in all cases. They were often covered with little tracts, rosy grey, the remains of adhesions. The part of the parietal surface corresponding to these tracts presented a dull granulated condition, particularly noticeable with oblique light. These *debris* indicated the cohesions of the meninges; and in fact, especially upon the posterior surface, there was almost always a sort of agglutinative drawing of the envelopes to the points where the irritative inflammation had most exerted itself. Even with the naked eye might be observed little projections of the size of a very small pin's head, somewhat rounded in form, greyish, and resistant, placed near the vessels, and which were recognized to be tubercular granulations, imprisoned, so to speak, in the vascular meshes of the morbid products of the serous membrane.

In severe cases the internal surface of the dura mater, covered by its arachnoid lining, might be seen studded with a veritable eruption of these little bodies. Sometimes a notable quantity of liquid, pretty fluid, of a yellow citron colour, escaped immediately after the section of the dura mater. The arachnoid offered also notable changes, especially upon the posterior surface of the cord in the median line in the direction of the longitudinal fissure. It was thickened, irregular, muddy, showing at places greyish zones

a Archives de Physiologie par Brown-Sequard, Charcot, and Vulpian, 1870.

disposed longitudinally or concentrically, sometimes rounded, some-
times adherent to the deeper parts, and at such points it could not
be separated from the underlying morbid mass, which was thick,
granular, greyish yellow, or very vascular at spots, and involved to
a certain depth, and, as far as the substance of the cord itself, the
parts which, in the normal state, are almost free in the sub-arachnoid
spaces. At these points, by the naked eye, little projections of the
volume of a millet seed, resistant, rounded, isolated, or conglo-
merated, but most frequently placed along the vessels, were
observed. Also in this sub-arachnoid cellular tissue, where the
lesions had often their maximum of intensity, was found a muddy
serosity of a puriform aspect, more or less thick, and, as it were,
elastic. These masses of pathological products thus infiltrated,
joined to the œdema and to the general pastiness, gave to the
posterior surface of the cord an aspect altogether special. There
were projecting points, opaque spots, where it was no longer possible
to discern either vessels or spinal nerves, at least at their roots; all
these parts were comprised in the thickening and neoplastic trans-
formations, and it was necessary to proceed by careful dissection
with needles to analyse completely the lesions produced, and their
relations with the normal parts.

By thus proceeding, although some granulations were remarked
accompanying some branches of the spinal nerves, it was dis-
covered that their relations existed especially with the vessels.

These granulations were found, in fact, always either around a
vessel or upon its sub-divisions. They seemed sometimes to have
narrowed the calibre by augmenting the parietal mass of the
vessel, or to have at least influenced the circulation, for on both
sides the vessels had undergone modifications in their reciprocal
divisions. The colouration of red globules along the vessels was
seen, except where there was an opaque mass. The vessels of the
surrounding regions were distended with blood; the veins especially
appeared sinuous, voluminous, and of a blackish blue tint.

There was always a very notable preponderance of these lesions
upon the posterior surface of the cord; they were met with in
every region.

When the meninges which penetrated into the grooves were
drawn out, analogous alterations were sometimes observed. The
lesion also penetrated, in some instances, into the meshwork of the
cord itself, and the same tubercular manifestation was noted in the
meningeal expansions which passed to the smallest medullary

elements. There, also, it seemed to be by the vessels and the connective tissue surrounding them, that the morbid propagation extended.

In all cases analogous lesions existed in the encephalon and its membranes.

Dr. Liouville submitted the morbid products, both in the recent state and after hardening, to microscopic examination, and found in all the points of the meninges affected a considerable formation of young and simple elements, almost all of the same form and the same dimensions, in the connective tissue, and particularly in great number in the neighbourhood of the vessels, with which they seemed to have certain relations; a proliferation of similar elements in the lymphatic sheath and the adventitious membrane of the vessels. In the greater number of the cases a coagulation of fibrinous appearance occurred in the interior of certain vessels. The little elements so numerous and pressed together were infiltrated, sometimes forming veritable uniform thickenings; sometimes they assumed, on the contrary, the disposition of a tubercular nodule with a central zone, composed of elements undergoing granular fatty degeneration.

The writer concludes from his researches that for the spinal cord, as for the encephalon, there may be distinguished

> A spinal tubercular meningitis,
> A tubercular meningo-myelitis,
> A tuberculization of the substance of the cord itself,

and that there is an absolute identity in the morbid manifestations in the whole extent of the cerebro-spinal envelopes. This does not exclude any seat of predilection. It does not signify that a special point should not be stricken more frequently and more intensely than other points; but that which stands out prominently is a sort of uniformity in the lesions agreeing with the similarity of structure.

He considers that by this means will be explained more naturally many of the symptoms attributed up to the present wrongly to the modifications of the cerebrum alone. Troubles of the mobility and sensibility, stiffness of the neck and of the trunk, some sorts of tetanic spasms, contractions, shaking, trembling, certain functional paralysis (of the bladder and rectum, for example), the protean modifications of hyperæsthesia or of anæsthesia; finally, even the infirmities which result in some cases of cure find an explanation more simple, because more true, in the possibility of these tubercular spinal lesions of the envelopes or of the centres.

ATHETOSIS.

Under the name Athetosis Dr. Hammond[a] has described an affection which he believes has not hitherto been recorded, and which is characterized by an inability of the patient to retain his fingers and toes in any given position and by their continual motion. He has observed two cases of this curious affection, both of which occurred in epileptics. In one of these patients the symptoms were observed after an attack of delirium tremens which had been followed by a condition of unconsciousness for six weeks.

" Soon after recovering his intelligence, he noticed a slight sensation of numbness in the whole of the right upper extremity, and in the toes of the same side. At the same time severe pain appeared in these parts, and complex involuntary movements ensued in the fingers and toes of the same side.

" At first the movements of the fingers were to some extent under the control of his will, especially when this was strongly exerted, and assisted by his eyesight, and he could, by placing his hand behind him, restrain them to a still greater degree. He soon, however, found that his labour was very much impeded, and he had gradually been reduced, from time to time, to work requiring less care than the finishing, at which he had been very expert.

" The right forearm, from the continual action of the muscles, was much larger than the other; and the muscles were hard and developed, like those of a gymnast.

" When told to close his hand, he held it out at arm's length, clasped the wrist with the other hand, and, then exerting all his power, succeeded, after at least half a minute, in flexing the fingers, but instantaneously they opened again and resumed their movements."

Dr. Hammond is inclined to think that this affection is analogous to chorea and cerebro-spinal schrosis, and that the symptoms point to implication of intra-cranial ganglia, and of the upper portion of the spinal cord.

DIAGNOSIS OF ORGANIC DISEASE OF THE BRAIN IN CHILDHOOD.

On the subject of the differential diagnosis of functional from organic disease of the brain in childhood, Dr. West[b] gives the following suggestions:—

" It is most difficult to lay down rules for the avoidance of error for

[a] Diseases of the Nervous System. New York : Appleton. 1871.
[b] Disorders of the Nervous System in Childhood. Longmans. 1871.

while it is undoubtedly true that neuralgia may follow either on some previous ill-defined feverish attack, or may take place during convalescence from typhoid fever, it is just in such conditions that real disease of the brain oftenest comes on ; and the latter is of far more frequent occurrence than the former. It may, however, be of some use to bear in mind that neuralgic pain is localized in some part of the head ; that, while it is very intense and accompanied with excessive intolerance of light and sound, it is also often attended with weeping, and the importance of tears as disproving the existence of real inflammatory disease either in the head or chest, first dwelt on by Trousseau, cannot be overrated. The intervals between the paroxysms are times not only of perfect ease, but of cheerfulness ; sickness is absent, the power of taking food is not lost, and sleep, if not interrupted by pain, is quiet and refreshing. Moreover, there is no dizziness, though there may be heat of head ; the pulse is unusually quick and feeble, and, I must add, may be irregular or actually intermittent, for while, as a general rule, irregularity of the pulse is one of the least invariable symptoms of disease of the brain, there are some children with whom any disorder of the nervous system, especially such as is sympathetic with disturbance of the digestive organs, is invariably attended with irregularity of the heart's action.

"Pain, dependent on real cerebral disease is rarely limited to one part of the head ; or, if it be, is referred to the forehead. It is generally, though not invariably, less intense, the intermissions of suffering are less complete, and some one symptom almost always attends the pain : it may be sickness or obstinate constipation, or dislike of light or sound, even when the pain abates—some one symptom, small in itself, but enough to keep alive the anxiety of anyone who subscribes to Morgagni's saying, that ' the habit of observation is the foundation of the art of Medicine.' "

HALF-YEARLY REPORT ON PUBLIC HEALTH.[a]

By CHARLES A. CAMERON, Ph.D., M.D., L.K. & Q.C.P.;
Prof. of Hygiene in the Royal College of Surgeons; Lecturer
on Chemistry in Steevens' Hospital Medical College, and in the
Ledwich School of Medicine; Analyst to the City of Dublin, &c.

NATURE OF CONTAGION AND GERMINAL MATTER.

DR. SANDERSON is continuing his important investigations into
the intimate nature of contagion, and his latest results are given to
us in an appendix to Dr. Simon's thirteenth Annual Report (for
1870) to the Privy Council. In his previous Report upon the
nature of contagion Dr. Sanderson defines microzymes as " living
particles which, in the earliest stage of their existence, are spheroids
not exceeding $\frac{1}{2000}$ of an inch in diameter, but subsequently
lengthen into rods." Their existence is associated with the com-
mencement of putrefactive decomposition of nitrogenous com-
pounds. The questions as to their origin and destiny have not
hitherto been satisfactorily answered. Dr. Sanderson now pro-
poses to solve the problem—whether these minute particles are a
race of individuals, more or less similar, each of which springs from
and may reproduce a similar being, or germs " in which a specific
form is wrapped up," and which are capable of developing into the
higher forms of life from which they spring. The experiments
which Dr. Sanderson had made, and some of the results of which
are now published, have for their object the investigation of the
origin, growth and development of microzymes, and the examination
of the conditions which are fatal or favourable to their existence in
the liquid and gaseous matters by which we are surrounded.

Microzymes, or *bacteria*, are classed by the great majority of
naturalists amongst the members of the animal kingdom, and are
placed next to the monads. Hallier, however, believes them to be
produced by the cleavage and multiplication of nuclei in the cells
of fungi, and that they are capable of development into the higher
forms from which they spring. The animal nature of these tiny
objects is apparently shown by the fact that they possess loco-
motive powers, and that they absorb oxygen and exhale carbonic

[a] The author of this report will be glad to receive any books, pamphlets, or papers
relating to hygiene, dietetics, &c. They may be forwarded through the agencies of
this Journal.

acid, like animals. Dr. Sanderson evidently considers bacteria to
be members of the animal kingdom, but there is no conclusive
evidence on that point. It has been proved that they are capable
of growing in liquids destitute of albuminous bodies. " Pasteur's
solution " consists of sugar, tartrate of ammonium, and the ashes of
yeast dissolved in distilled water; in this solution bacteria freely
grow. Now it is a well established fact that ammonia, although
rich in nitrogen, possesses no nutritive properties whatever as a
food for animals. Plants derive their nitrogen nearly altogether
from ammonia; but the nitrogen of animals is supplied directly or
indirectly by the albuminoids of plants. As well might an animal
endeavour to obtain carbon from carbonic acid as to attempt to
nourish itself with the nitrogen of ammonia. Kuhlman's experi-
ments,[a] performed many years ago, conclusively prove that salts of
ammonia exercise no influence on the nutrition of animals. When
oxygen is utterly excluded, bacteria cease to grow; but may not
that be owing to arrestation in the decay of the organic matter upon
which the bacteria feed? The movements of the bacteria are one
of the strongest arguments in favour of their animal nature; but it
must not be overlooked that very remarkable motions are observ-
able in objects unquestionably belonging to the vegetable kingdom.
Amongst the sea weeds we find the Oscillatorias (filaments con-
taining granular and fluid matter) advancing by means of a regular
undulating movement through the water. When examined in
water under the field of the microscope, they are frequently ob-
served to cross from one side to the other. The spores of some
cryptogamic plants exhibit motions; and in the Antheridia there
are certain cells containing bodies, which have been termed phy-
tozoa, or spermatozoids, which exhibit motions during a portion
of their existence.

Whether bacteria are animals or plants is, after all, a matter
which possesses but little interest to the pathologist. The
really important point to be determined—so far as their origin is
concerned—is, do the bacteria spring from or develop into higher
forms of life? In examining this question, Dr. Sanderson is
obliged to deal with the obscure subject of " spontaneous gene-
ration," which has puzzled so many inquirers from the earliest
period of philosophic inquiry down to the present time. He does
not, indeed, discuss the question whether or not under any con-
ditions it is possible for inanimate matter to become animate

[a] See Comptes Rendus, xxiv., 263.

without the intervention of living things; but his experiments, so far as they go, prove conclusively that as regards " the animal liquids and tissues, and the liquids which will be used as tests for the presence of microzyme germs, no spontaneous evolution of any organic form ever takes place."

Bacteria, or microzymes, grow in liquids and moist air. In liquids they do not manifest any tendency towards a connective arrangement if they are motionless; and even when they exhibit activity, their movements are not governed by any mutual relation on the surface of liquids. However, the bacteria after a while adhere (probably by the intervention of a gelatinous substance) to each other by their sides—somewhat in the same way that columnar epithelium is formed—and produce a " scum."

Sometimes the common bacteria, which grow on moist surfaces, from with their intervening jelly, viscous masses sufficiently large to be recognizable by the unassisted eye. These masses of microzymes have been termed Zoöglæe by Cohn. When these masses are carefully observed, foci of growth are perceived, at which the particles are spheroidal, and are indefinitely minute. Around the foci are zones of matrix, in a state of disintegration, containing staff-shaped microzymes of larger size, which afterwards disengage themselves and exhibit their proper movements. At this juncture it is probable that the microzymes become distinguishable entities in the form of spheroids; but subsequently they multiply by division.

As to the conditions of the origin of microzymes, there is a conflict of opinion; but the great majority of observers consider that they do not spring into existence spontaneously. It is, however, shown that liquids which under the highest power of the microscope appear to be perfectly free from solid particles, yet subsequently evolve microzymes without being in contact with the air. Presumably, therefore, such liquids must contain germinal matter, unless we assume that minute living beings spontaneously come into existence in them. Dr. Sanderson believes that even when water appears to be perfectly homogeneous, it may not be so in reality, but that it may contain germinal particles so excessively minute as to elude detection when sought for by means of the most powerful microscope.

With respect to the chemical nature of bacteria, Dr. Sanderson shows that they consist chiefly of albuminoids, and that their matrix is albuminous. They take nitrogen from almost every substance

in contact with them, and employ this element in the building up of their own organisms. Microzymes may be regarded as the pioneers, if not the producers, of putrefaction. The evidence produced by Dr. Sanderson proves that so long as germinal matter is excluded from liquids containing certain animal and vegetable matters, the latter resist decomposition for very long periods of time; whilst the presence of the smallest quantity of microzymal germinal matter speedily sets up fermentation or putrefaction. Dr. Sanderson does not, however, commit himself to the positive statement that microzymes are the first cause of putrefaction; indeed, he does not deny but that organic matter may putrefy under the conjoint influence of heat and moisture solely. Some experiments recently performed[a] by Hoppe-Seyler afforded results which seemed to show that temperature has more influence in producing putrefaction and fermentation than organisms have.

We shall now briefly state the more important results of Dr. Sanderson's experiments. It is shown that liquids containing organic matter which have been highly heated do not ferment, provided the air with which they are in contact had also been highly heated. The same kind of liquids when they have not been exposed to a high temperature soon contain organisms. Boiled liquids containing such substances as serum of blood, when freely exposed to ordinary air, do not evolve bacteria, but they become after a-while covered with tufts of penicillium. Are we then to infer from these facts that the germs from which microzymes spring do not exist in ordinary air, whilst the vegetable spores from which penicillium are produced do exist abundantly in that medium? When bacteria appear to originate spontaneously in liquids containing decaying animal matters, their real source is the germinal matter contained in the liquids.

It is remarkable that whilst distilled water may be obtained free from embryo bacteria, yet that ordinary distilled water often contains so much germinal matter that even the small quantity used in rinsing a glass is sufficient to develop large numbers of bacteria in a large volume of water. This zymotic property of distilled water is acquired either by admixture with traces of other waters, or by contact with moist surfaces of bottles, &c. The relative zymotic power of waters—or, as Dr. Sanderson terms it, the "faculty of water to determine the development of organic forms in a test solution to which it is added"—may be estimated by comparing the degree of

[a] See Med. Chem. Unters., p. 565. 1871.

opalescence produced in each of two or more specimens by Pasteur's test solution. By thoroughly drying the germinal matter of microzymes, it is rendered inactive even when the dessication is effected at a low temperature. When water is contaminated by apparently dry surfaces, it is only when the dessication of the germinal matter is incomplete. Disinfectants, such as, for example, chlorine, carbolic acid, and Condy's liquid, may be applied to solutions in such quantity as merely to prevent the development of bacteria without arresting the growth of penicillium. One of the most important results of Dr. Sanderson's experiments is that which proves that filtration (through animal charcoal?) does not destroy the zymotic power of water. We have often expressed the opinion that the boiling of potable water is the only certain method of destroying any germs of cholera or enteric fever which may be present in it. Animal charcoal undoubtedly possesses the power of removing from water any decaying animal and vegetable matter which the latter may contain; but the vital properties of germinal matter enable it to resist those wonderful chemical powers which work so mysteriously in the pores of charcoal.

To the medical man the most important of Dr. Sanderson's investigations are those which are described in the latter portion of his Report. Their results seem to show that the normal tissues and fluids of animals do not contain bacteria or their germs. Hallier has stated that visible *micrococci* (microzymes are termed micrococci by those who believe that zymotic particles are vegetable) occur abundantly and constantly in the blood of persons suffering from contagious disease; and, according to Béchamp, they occur in living normal tissue. Dr. Sanderson has examined the blood of patients affected with scarlatina, and found that it did not contain microzymes. He admits, nevertheless, that it is possible the germinal matter of these organisms might be in the blood of persons suffering from contagious maladies, although not discoverable by the aid of the microscope. Pus from a pyæmic abscess when placed in a test solution produced in a few days immense numbers of bacteria; whilst the ordinary products of inflammatory action (simple pus) produced no such effect in test solutions. This is a most interesting fact.

The chief points established by Dr. Sanderson are as follows:—

Firstly, that fungi are not developed from microzymes or microzymes from fungi, the common association of the two being nothing more than accidental.

Secondly, that the spores of fungi exist abundantly in the atmosphere, from which they pass into liquids.

Thirdly, that microzymes are not found in ordinary air, but in water and on the moist surfaces of solids.

Fourthly, that animal tissues and fluids do not contain visible microzymes.

Lastly, that at least one morbid product of animals (pyæmic pus) contains the germinal matter which produces bacteria.

ON DISINFECTANTS AND DISINFECTION, WITH SPECIAL REFER-
ENCE TO THE GERM THEORY OF PUTREFACTION.

In the popular and most comprehensive sense, all bodies are termed disinfectants which are used for the purpose of preventing rapid decay in organic bodies, of removing foul odours, and destroying mephitic gases and vapours. Many of the most valuable of the disinfectants are really antiseptics; they act by preventing putrefaction and fermentation, although they do not altogether prevent a very gradual but innocuous decay. The disinfectants proper—such as, for example, chlorine and nitrous acid—do not preserve organic bodies from decay, but, on the contrary, if they are used in sufficient quantity, they usually utterly destroy, *i.e.*, mineralize them. There are animal and vegetable bodies which are agents intermediate between disinfectants proper and antiseptics, pure and simple: these bodies prevent decay in organic matter, not yet putrefying or fermenting, whilst they destroy more or less completely the offensive products of putrefaction, such as, for example, sulphuretted hydrogen and the fœtid ammonias.

In the last section when treating of Dr. Sanderson's investigations we pointed out that the presence of low forms of life or their germs is in some way associated with putrefaction. Now, most of the substances employed as disinfectants possess the power to destroy these minute organisms and their germs. It is remarkable that some substances which are deadly poisons to the highest members of the animal kingdom can actually be eaten with impunity, and apparently with advantage, by creatures of lower organization; whilst, on the other hand, bodies which exercise little, if any, toxic effect upon the higher animals are capable of destroying many kinds of those tiny animated specks which we designate animalcules. It is evident that if the germ theory of contagious disease be true, the greater the power of disinfectants to prevent the evolution of low forms of life is, the more valuable are they as

sanitary agents. A large number of disinfectants is at present in use, and it would be of great practical importance were their relative values clearly established.

In a paper[a] read before the meeting of the British Association for the Advancement of Science, held in August, 1871, Dr. John Dougall, of Glasgow, gives the results of numerous experiments which he has made to test the relative values of disinfectants, and to determine whether or not putrefaction is influenced by the presence of animalcules or their germs. Three series of experiments were made—two with vegetable, and one with animal, substances. Nearly one hundred bodies were used as disinfectants, including irritant, narcotic and narcotico-irritant poisons. The disinfecting solution was made by mixing one part of the disinfectant with 500 parts of water. To three drachms of this solution was added one drachm of a filtered infusion of hay, of the strength of half a drachm of dried hay, to one fluid ounce. The mixture was put into a phial, and, in case it was volatile, kept closed, but otherwise the phial was left open. The animal substances used were human urine in one set of experiments, and a mixture of beef juice and egg albumin in another; but only half a drachm of the mixture was added to three and a half drachms of the test solutions. Three "blank experiments" were made—that is, the organic mixtures were allowed to stand without disinfecting solutions being added to them, so that any contrast in the growth of animalcules in the simple and supposed preventive solutions might be observed. The phials were kept at a medium temperature of 60° Fahrenheit, and exposed to a moderate amount of light. In from two to six days the microscopical examinations of each series—the magnifying power employed being 700 diameters—were begun and finished. The results of the examination to be specially noticed were— animal life or no animal life. Fungi were generally present more or less abundantly in all cases, but their occurrence was not regarded as of importance. In those cases where animalcules were present the bottles were re-filled with stronger solutions; conversely weaker solutions were used, and after being allowed to stand were again microscopically examined; and the process was repeated until a point was reached when none, or but the faintest sign of life, was perceptible. Finally, in order to confirm or correct

[a] On the Relative Powers of various Substances in Preventing the Generation of Animalculæ or the Development of their Germs, with special reference to the Germ Theory of Putrefaction.

the conclusions deduced from all the experiments above described, Dr. Dougall repeated the experiments:—

"Separate solutions were prepared of the various substances, each of its recorded preventive strength, with the same proportions of each of the organic fluids added as hitherto. They were then set aside under the same circumstances, for the same length of time, and again examined microscopically, and the results finally adopted.

"It may be stated that most of the solutions had to be examined from three to eight times in each of the three series of experiments; the strength of the separate mixtures requiring to be either augmented or diminished at every inspection, before their preventive powers could be ascertained."

The following table gives the chief results of Dr. John Dougall's experiments, but we have omitted references to a few substances which are not likely ever to be used as disinfectants.

TABLE *showing the amount of various substances which prevents the appearance of Animalculæ in six days at about* 60° *Fahrenheit, when added to infusion of Hay, to Human Urine, and to a mixture of Beef Juice and Egg Albumin.*

	Hay	Urine	Beef Juice & Albumin	Average
I. METALLIC SALTS.				
Sulphate of Copper, - - -	1·1000	1·1000	1·800	1·933·3
Bichloride of Mercury, - - -	1·700	1·700 f.p.[a]	1·500	1·633·3
Protosulphate of Iron, - - -	1·500	1·500	1·100	1·366·6
Arsenious Acid, - - - -	1·750	1·150	1·50	1·316·6
Sulphate of Iron and Potassium (Iron Alum), - - -	1·300	1·300	1·300	1·300
Chloride of Zinc, - - - -	1·300	1·300 f.p.	1·300	1·300
Sulphate of Zinc, - - - -	1·300	1·300 f.p.	1·200	1·266·6
Average, - - - -	1·554·54	1·381·8	1·277·27	[b]1·371·18
II. ORGANIC ACIDS.				
Benzoic, - - - - -	1·700	1·700	1·200	1·533·3
Hydrocyanic (B.P.),[c] - - -	1·500	1·500 f.p.	1·500 f.p.	1·500
Picric - - - - - -	1·350	1·350	1·350	1·350
Oxalic, - - - - -	1·350	1·350	1·200	1·300
Carbolic, - - - - -	1·300	1·300	1·200	1·266·6
Acetic (B.P.), - - - -	1·350	1·25	[d] „	1·125
Average, - - - -	1·407·1	1·332·1	1·207	1·315·45

[a] F.P. denotes faint putrescence. Where these letters are absent, the mixture remained free of odour.

[b] B.P. denotes British Pharmacopœia.

[c] The average of the averages in right hand column corresponds with the average of the three averages of the perpendicular columns.

[d] The various blanks in the columns indicate that the substances opposite which they are placed are incapable of preventing putrefaction and the appearance of animalculæ at 1·10.

	Hay	Urine	Beef Juice & Albumin	Average
III. Salts of the Earths.				
Chloride of Aluminum, - - -	1-2000	1-500 f.p.	1-300	1-933·3
Sulphate of Aluminum and Potassium (Alum) - - -	1-800	1-500 f.p.	1-100	1-466·6
Solution of Chloride of Calcium, -	1-200	1-200	1-25	1-141·6
Chloralum (Commercial) - - -	1-300	1-50	1-50	1-133·3
Sulphate of Magnesia, - - -	1 250	1-50	,,	1-100
Bisulphite of Lime, - - -	1-100	1-50	1-25	1-58·3
Average, - - - -	1-608·3	1-225	1-83·3	1-305·5
IV. Inorganic Acids.				
Sulphuric (B.P.), - - - -	1-800	1-500	1-100	1-466·6
Nitric (B.P.), - - - -	1-400	1-400	1-200	1-333·3
Hydrochloric (B.P.), - - -	1-500	1-400 f.p.	1-100	1-333·3
Sulphurous (B.P.), - - -	1-250	1-50	1-50	1-116·6
Average, - - - -	1-440	1-320	1-110	1-289·96
V. Alcohol and its Derivatives.				
Chloral Hydrate, - - - -	1-600	1-600 f.p.	1-300	1-500
Perchloride of Formyle (Chloroform)	1-500	1-400 f.p.	1-25	1-308·3
Alcohol, - - - - - -	1-350	1-50	1-20	1-140
Acetone, - - - - -	1-100	,,	,,	1-33·3
Average, - - - -	1-400	1-258·3	1-140·83	1-266·33
VI. Inorganic Bases.				
Tincture of Iodine, - - - -	1-400	1-400	1-50	1-203·3
Caustic Potash, - - - -	1-300	1-50	1-10 very putrid	1-120
Average, - - - -	1-350	1-225	1-30	1-201·6
VII. Organic Salts.				
Hydrochlorate of Strychnia, - -	1-450	1-450	1-300	1-400
Acetate of Morphia, - - -	1-500	1-25	,,	1-175
Stearate of Soda (Hard Soap), -	1-25	1-25 f.p.	1-25	1-25
Average, - - - -	1-368·75	1-131·3	1-87·5	1-195·8
VIII. Inorganic Alkaline Salts.				
Bichromate of Potassium, - -	1-900	1-900	1-900	1-900
Permanganate of do., - -	1-500	1-200	1-125	1-275
Chlorate of do., - -	1-500	,,	,,	1-166·6
Hyposulphite of Soda, - - -	1-250	,,	,,	1-83·3
Condy's Fluid, - - - -	1-200	,,	,,	1-66·6
Sulphate of Soda, - - - -	1-75	,,	,,	1-25
Chloride of do., - - - -	1-25	,,	,,	1-8·3
Average, - - - -	1-297·2	1-122·2	1-113·88	1-177·76
IX. Volatile Gums.				
Camphor, - - - - -	1-300	1-150 f.p.	1-50	1-166·6
X. Aromatic Oils.				
Oil of Carraway, - - - -	1-400	,,	,,	1-133·3
Oil of Peppermint, - - - -	1-250	,,	,,	1-83·3
Average, - - - -	1-350			1-116·6

TABLE—*Continued.*

	Hay	Urine	Beef Juice & Albumin	Average
XI. ORGANIC BASES.				
Glycerine, - - - - -	1-300	,,	,,	1-100
XII. BITTER EXTRACTS.				
Aqueous Extract of Quassia, - -	1-50	,,	,,	1-16·6
XIII. ANIMAL SUBSTANCES.				
Tincture of Musk, - - - -	1-50	,,	,,	1-16·6
Spirituous Extract of Cantharides, -	,,	,,	,,	,,
XIV. AROMATIC EXTRACTS.				
Spirituous Extract of Capsicum (Cayenne), - - - -	1-25	,,	,,	1-8·3
XV. POISONOUS VEGETABLE EXTRACTS SPIRITUOUS AND AQUEOUS.[a]				
Extract of Aconite, - - -	,,	,,	,,	,,
Extract of Belladonna, - - -	,,	,,	,,	,,
Extract of Calabar Bean, - -	,,	,,	,,	,,
Extract of Tobacco, - - -	,,	,,	,,	,,

NOTE.—The parts of water indicated in the tables represent dropped minims, forty to the drachm.

Example.—1-500 signifies one grain, if the chemical substance be a solid, or one dropped minim, if a fluid, in 500 minims of water, forty of which make one drachm.

The following are the most important features of Dr. Dougall's experiments. The metallic salts show the highest preventive power, but some of them stand low in the group, whilst sulphate of copper has a very high preventive power. The organic acids have, as a group, a preventive energy nearly equal to that of metallic salts; but the extremes in this group are not so great as in the case of the metallic salts. Amongst the inorganic acids, sulphuric acid occupies a very high place, and it brings up its group to a comparatively high position. Alcohol and its derivatives have higher preventive power than we had believed them to possess. Were it not for the remarkable disinfecting properties of bichromate of potassium, the preventive powers of the inorganic alkaline salts would be very low. The salts of the alkaline earths would also have a low place were it not for the chloride of aluminum, which possesses extraordinarily high antiseptic powers. The aromatic oils are inert in the urinous and albuminous liquids, but have a tolerable preventive power in the hay infusion. The groups of animal substances and bitter extracts show little save

[a] Simple aqueous solutions of the poisonous vegetable extracts soon teem with life.

blanks; and the poisonous vegetable extracts have literally no preventive power at all.

It is curious that sulphurous acid, which has so long been extolled as a powerful disinfectant, should be found by Dr. Dougall to be inferior to oil of vitriol and other bodies not usually classed amongst disinfectants. Dr. Dougall used, however, the solution of sulphurous acid gas in water prepared according to the formula given in the British Pharmacopœia. This solution contains only 10 per cent. of actual sulphurous acid; whilst we presume Dr. Dougall employed the strong sulphuric acid of the Pharmacopœia. Permanganate of potassium and Condy's fluid—disinfectants of high reputation—possess very feeble preventive power. Bichromate of potassium gave such good proofs of its preventive power that Dr. Dougall was led to experiment with its acid constituent, chromic acid. This body he found to possess the following preventive powers:—

Hay infusion, 1·4000; urine, 1·1400; beef juice and egg albumin, 1·1200; average, 1·2200.

These results prove the remarkable disinfecting properties of chromic acid, and Dr. Dougall expresses an opinion that this compound will yet take the foremost place amongst sanitary agents. It is, however, doubtful if chromic acid can be produced at so low a cost as to enable it to compete with carbolic acid, chloride of lime, and other cheap disinfectants.

Dr. Dougall assigns a very high position to chloride of aluminium amongst the disinfectants. In the case of the hay infusion, its preventive power is double that of any of the other substances named in the tables. We have had considerable experience of this disinfectant, and we believe it to be deserving of general use. Under our directions chloralum has been used to disinfect the sewage of Dublin, and the fœtid mud laid bare during low water on the foreshores of the River Liffey, and in each case with decided success, and at a low cost. One pound of chloralum (a commercial article containing a large proportion of chloride of aluminium, lately brought prominently under public notice by Mr. Gamgee, the eminent veterinarian) dissolved in five gallons of water was used in disinfecting twenty-five yards of fœtid slob. Mr. Wanklyn, the well-known London chemist, says of chloralum:—" For removing fœtor and effluvia it is better and more available than any agent with which I am acquainted. In this respect it is incomparably superior to chloride of lime."

Dr. Dougall did not use solution of chloride of lime in any of his experiments; and he does not give us the strength of the " solution of chloride of calcium" which he employed.

Dr. Dougall believes that animalcules and fungi rather prevent than cause putrefaction. They are nature's scavengers and sanitary police, sweeping away the decomposing organic matters, which, if not reorganized into the mechanisms of these tiny objects, would produce noxious vapours and gases. Animalculæ and fungi are the *signs*, but not the *cause* of decay. If organic matter be not present in a decomposing state, the fungi and bacteria will not appear, because there is no nutriment upon which they could subsist and multiply. Disinfectants, according to this view, would probably prove useful, not so much by destroying animalcules and fungi as by preventing rapid molecular changes in the substances with which they are mixed. Dr. Dougall's view of the functions of the lowest forms of animal life are in accord with those of Professor Owen. " Consider," says that philosopher when speaking of the infusoria, " their incredible numbers, their insatiable voracity, and that it is the particles of decaying vegetable and animal bodies which they are appointed to devour and assimilate. Surely we must in some degree be indebted to those ever-active invisible scavengers for the salubrity of our atmosphere. Nor is this all. They perform a still more important office, in preventing the gradual diminution of the present amount of organic matter upon the earth; for when this matter is dissolved and suspended in water in that state of comminution and decay which immediately precedes its final decomposition into the elementary gases, and its consequent return from the organic to the inorganic world, these wakeful members of nature's invisible police are everywhere ready to arrest the fugitive organized particles, and turn them back into the ascending stream of animal life. Having converted the dead and decomposing particles into their own tissues, they themselves become the food of large infusoria, and of numerous other small animals, as the rotiferæ, which in their turn are devoured by larger animals, as fishes; and thus a pabulum fit for the nourishment of the highest organized beings is brought back by a short route from the extremity of the realms of organic matter."

Dr. Dougall made a series of experiments with the view of determining the relative germicidal powers of certain disinfectants at their preventive points already ascertained. The following table exhibits in a somewhat curtailed form the results arrived at:—

TABLE *showing the results of adding an equal part of a putrid solution of Beef Juice and Egg Albumin, full of Animalculæ, to solutions of various substances of strengths known to be preventive.*

I. SUBSTANCES THAT DESTROY LIFE BUT NOT SMELL.[a]

Name of Substance	Strength	Effect on Animal-culæ in 15 minutes after mixing the Solutions	Whether the Mixture is deodorized	Whether Animal-culæ are present after four days	Condition after four days as to Odour
Sulphate of Copper, -	1·800	Death	No	A few vibriones	F. P.[b]
Stearate of Soda (Hard Soap), -	1·25	Death	No	No	Putrid
Chloride of Zinc, -	1·300	Death	No	No	None
Nitric Acid, - -	1·200	Death	No	No	None
Hydrochloric Acid, -	1·100	Death	No	No	None
Benzoic Acid, - -	1·200	Death	No	No	None
Acetate of Lead, -	1·300	Death	No	Abundant	Very putrid
Iron Alum, - -	1·300	Death	No	Abundant	Very putrid
Sulphuric Acid, -	1·100	Death	No	Very abundant	Very putrid
Sulphate of Zinc, -	1·300	Death	No	No	Very putrid
Caustic Potash, -	1·10	Death	No	No	Very putrid
Sulphurous Acid, -	1·50	Death	No	No	F. P.
Bisulphite of Lime, -	1·25	Death	No	No	F. P.

II. SUBSTANCES THAT DESTROY LIFE AND PARTLY SMELL.

Bichromate of Potassium, - -	1·900	Death	Considerably	A few vibriones	F. P.
Tincture of Iodine, -	1·50	Death	Partly	No	F. P.
Hydrochlorate of Strychnia, -	1·300	Death	Partly	No	None

III. SUBSTANCES THAT DESTROY BOTH LIFE AND SMELL.

Alcohol, - - -	1·20	Death	Yes	No	F. P.
Solution of Chloride of Lime, -	1·25	Death	Yes	No	None
Bichloride of Mercury,	1·500	Death	Yes	No	None
Picric Acid, - -	1·350	Death	Yes	No	F. P.

IV. SUBSTANCES THAT PARTLY DESTROY SMELL BUT NOT LIFE.

Bromal Hydrate, -	1·500	Myriads of active Vibriones	Partly	No	None
Camphor, - -	1·50	Myriads of active Vibriones, also large Animalculæ	Partly	No	None
Chloral Hydrate, -	1·300	Myriads of active large and minute Animalculæ	Partly	No	Putrid
Carbolic Acid, - -	1·200	Teeming with Vibriones	Partly	No	F. P.

[a] The headings of the various divisions refer exclusively to the results tabulated in the third and fourth columns.

[b] F. P. denotes faint putrescence.

TABLE—*Continued.*

V. SUBSTANCES THAT DESTROY SMELL BUT NOT LIFE.

Name of Substance	Strength	Effect on Animalculæ in 15 minutes after mixing the Solution	Whether the Mixture is deodorized	Whether Animalculæ are present after four days	Condition after four days as to Odour
Nitrate of Silver, -	1-50	Myriads of minute life	Yes	Abundant	F. P.
Permanganate of Potassium, -	1 25	Teeming with minute life	Yes	No	F. P.

VI. SUBSTANCES THAT NEITHER DESTROY LIFE NOR SMELL.

Nitrate of Ammonium,	1-25	Myriad life	No	Abundant	Putrid
Ferrous Sulphate, -	1-100	Abundant minute life	No	Abundant	Very putrid
Hydrocyanic Acid, -	1-500	Abundant life	No	No	F. P.
Chloroform, - -	1-25	Life	No	No	None
Tartrate of Antimony,	1-300	Abundant life	No	Abundant	Putrid

NOTE.— In the above table, with two exceptions—nitrate of silver and permanganate of potassium—life is always accompanied by putrefaction, though the converse is not the case—another proof that germs are not the cause of putrefaction.

Dr. Sanson, in his recently published work,[a] expresses his belief in the "germ theory" of putrefaction, and he considers the germs to be of vegetable origin. With respect to the nature of the *materies morbi* of contagious disease he says, "I have been led to enunciate the theory that the poisons of spreading diseases are extremely minute living organisms, having the characteristic predominants of vegetable growths, analogous to the minute particles of vegetable protoplasm, whose functions it is to disintegrate and convert complex organic products, owing their specific properties to the special disease, not to any botanical peculiarity, but to the characters implanted in them by the soil in which they first sprang from innocuous parents, and from which they are transmitted—this soil (except in the case of their earliest origin) being the fluids of the animal body."

In a lecture on "Dust and Disease" delivered by our eloquent countryman, Dr. John Tyndall, last June, in the Royal Institution of Great Britain, he thus expresses his belief in the germ theory of contagious diseases:—

"But this is by no means all. Besides these universally admitted cases, there is the broad theory now broached and daily growing in

[a] The Antiseptic System. By Arthur E. Sanson, M.D. London: H. Gilman, 1871.

strength and clearness—daily, indeed, gaining more and more of assent from the most successful workers and profound thinkers of the medical profession itself—the theory, namely, that contagious disease generally is of this parasitic character. If I had heard or read anything since to cause me to regret having introduced this theory to your notice more than a year ago, I should here frankly express that regret. I would renounce in your presence whatever leaning towards the germ theory my words might then have betrayed. Let me state in two sentences the grounds on which the supporters of the theory rely. From their respective viruses you may plant typhoid fever, scarlatina, or small-pox. What is the crop that arises from this husbandry? As surely as a thistle rises from a thistle-seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox. What is the conclusion that suggests itself here? It is this—that the thing which we vaguely call a virus is to all intents and purposes a *seed ;* that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life—this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life."

Dr. Tyndall suggests that those exposed to contagion should wear a respirator; and he recommends one "invented by Mr. Carrick, an hotel-keeper at Glasgow, which meets the case effectually, and, by a slight modification, may be caused to meet it perfectly. It consists of a space under a partition of wire-gauze intended by Mr. Carrick for 'medicated substances,' and which may be filled with cotton-wool. The mouth is placed against an aperture, which fits closely round the lips; and the air enters the mouth through the cotton-wool by a light valve, which is lifted by the act of inhalation. During exhalation this valve closes; another breath escapes by a second valve into the open air. The wool is thus kept dry and cool; the air passing through it being filtered of everything it holds in suspension."

At the meeting of the British Association, held in August 1871, Dr. Grace Calvert read a paper on the action of heat upon germ life. He stated that he exposed solutions containing microscopic life to different degrees of temperature. At 100° Fahrenheit the living organisms were not affected; at 200° they were still unaffected; and at 300° some vibrios were still living, and until the temperature was raised to 400° some signs of life were

recognizable. In fluids where life had been destroyed by heating them up to 400°, no organisms were subsequently developed; whilst in solutions which had been heated up to lower temperatures than 400°, living things afterwards appeared. If we admit the accuracy of Dr. Calvert's experiments, the conclusion is forced upon us that it is probable that neither boiling water nor air heated up to 250° destroys the germs of disease. When drinking tea or coffee we may possibly thereby be introducing into our bodies the virus of cholera or typhoid fever; and the clothes which we receive from the hot air disinfecting chamber may still retain the poison of scarlatina or small-pox. Dr. Calvert's experiments have given results which certainly are at variance with those arrived at by a host of other biologists and microscopists. But whilst hesitating to accept Dr. Calvert's statements as correct, it would be well when heating bedding or clothing with the object of destroying germs, to prolong the temperature for many hours. Whilst it is conceivable that a low organism might possibly survive a momentary exposure to a temperature of 250°, or even 330°, it is incredible that it could long resist the continued influence of such high temperatures.

As we are discussing the subject of disinfection, the following remarks may not be out of place, and may possibly prove not altogether uninteresting to some of our readers.

Hygiene of the Sick Room.—The atmosphere of a room in which a patient lies cannot be subjected to the influence of such disinfectants as sulphurous acid or chlorine. Abundance of fresh air should be admitted—in fact, too much attention could hardly be paid to the ventilation of the apartment, and it should be provided with a fire-place. The larger the room is, the better for both patient and attendants. Light should, unless under very peculiar circumstances, be freely admitted. Solution of chloralum or permanganate of potassium should be placed in large saucers. The dejecta and saliva of the patient should be instantly covered with strong solution of bluestone, chloralum, or carbolic acid; and they should be speedily conveyed from the room. Slops of any kind ought to be promptly removed. The less furniture (consistent with comfort) the room contains the better. Window and bed curtains, carpets, and table cloths should not be tolerated. The linen which has been removed from the patient is best placed in a tub containing chloralum

In a house where there are several inmates, it is well to hang a sheet moistened with chloralum, &c., outside the door of the sick room. Instead of ordinary handkerchiefs, the patient might use rags, and these should be placed in a basin, and covered with disinfecting solution. The attendants should place themselves in such a way that the air entering the apartment would pass from them towards the patient. The less communication held between the inmates of the sick room and those of the other apartments (who are obliged to remain in the house) the better. Should the patient die, the body should be isolated, and interred as speedily as decency admits of.

Disinfection of the Empty Room.—After the removal of the patient, the room should be thoroughly cleansed, disinfected, and aired. All the furniture which admits of it should be washed with strong chloralum solution and removed to an empty room. The apartment being completely denuded of its furniture, the process of purification may be effectively performed in the following manner:—Wash the floor and woodwork with water and (preferably carbolic acid) soap. Remove the wall paper, first washing it with solution of chloralum or other disinfecting agent, so as to protect the workmen. Close up all openings except the door; and having generated a sufficient quantity of a powerful disinfectant, instantly retire and close the door.[a] After twenty-four hours the door and windows are to be thrown open, and in a few days the room is ready to be re-papered and its ceiling whitened.

The quantity of disinfectant used should be proportionate to the size of the room. If it contain 2,000 cubic feet of space, it would require the combustion of about 27 pounds of sulphur to convert all the oxygen of the air into sulphurous acid, and even then only one-fifth of the space in the room would be occupied with sulphurous acid. We find, indeed, from the results of actual experiment that unless a large quantity of disinfectant is set free in a room, that all life and foul odour in it is not destroyed. We do not think that less than four pounds of sulphur would produce sufficient fumes wherewith adequately to disinfect a room containing 2,000 cubic feet. Chlorine is, in our opinion, a somewhat more powerful disinfectant than sulphurous acid. For a
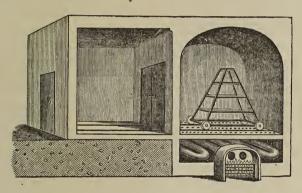
[a] When a very large quantity of chlorine gas is generated, the chimney should not be wholly closed.

room, such as that above described, it would be necessary to employ the gas evolved from a mixture of $2\frac{3}{4}$ pounds of alum cake and 3 pounds of chloride of lime, or (but mixed with hypochlorous acid) of 3 pounds of bleaching powder and 1 pound of oil of vitriol, diluted (previously) with four times its volume of water.

The sulphur is best burnt in one or more earthenware pipkins, containing a few red hot coals, and placed upon flags, slates, or over water, so as to avoid accident from fire. In liberating the chlorine the greatest care must be taken, especially when oil of vitriol is employed. The oil of vitriol should be diluted in an earthenware vessel, which is capable of withstanding the heat evolved from the mixture. The bleaching powder is best placed in a crock, and the diluted acid poured into the latter. As a copious disengagement of gas of a most irritating and poisonous nature takes place the instant the acid comes into contact with the powder, the operator must effect a precipitate retreat from the room, instantly closing the door after him. Whilst working a muffler should be kept over the mouth and nose. To disinfect with nitrous fumes, mix 1 pint of commercial nitric acid with an equal quantity of water, and pour the diluted acid upon half a pound of copper turnings. If copper filings be used, the disengagement of the fumes takes place very rapidly. A room may be disinfected by means of liquids; but in such case the purifier must be applied in the form of spray, which cannot, in all cases, be readily accomplished. The humid method of disinfection has, however, much to recommend it.

Disinfection of Clothing.—Clothes that are not injured by being washed may be disinfected by prolonged steeping in solutions of chloralum (half a pint of the commercial solution to a gallon of water) or chloride of lime (6 ozs. to the gallon). Coloured fabrics are injured by chloride of lime, and uncoloured linen and calico articles cannot be left long in its solution without being more or less injured. If Condy's solution be used, merely thoroughly immerse the linen in it, and speedily rinse out in cold water; for if the article be left too long in this solution it is liable to become stained. According to Dr. Dougall's experiments Condy's liquid does not, at a certain degree of strength at least, destroy fungi and bacteria. Air heated to from 280 degs. to 300 degs. Fahrenheit is undoubtedly the best disinfecting agent for clothing and bedding, as it does not in the slightest degree

injure the articles, whilst it is as effective as the most powerful of the ordinary disinfectants. An oven cautiously heated may be employed, the articles being kept in the heated air for a couple of hours at least. The Corporation of Dublin have constructed a hot air disinfecting chamber at a cost of £400. It is situated in Marrowbone-lane, in the "Liberties," and any one may have tainted clothing disinfected in it without any charge. It is to be regretted that the citizens of Dublin do not more frequently avail themselves of the great advantages which this hot air chamber offers as a means of stamping out scarlatina, whooping cough, and similar diseases. If this chamber were in constant requisition, we can hardly doubt but that the mortality from zymotic diseases in Dublin would soon be sensibly diminished.

The engraving shows the construction of the chamber. The walls and ceiling of the compartment in which the clothes are heated are built of brick, and its floor is composed of perforated iron plate. The heat is radiated into the compartment from the exterior surface of a coil of iron pipe, 80 feet long, and which acts as part of the furnace flue. As the products of the combustion which takes place in the furnace escape into the atmosphere, without previously mixing with the air contained in the close chamber, no emanations from the infected clothes can pass into the atmosphere, and consequently no one need be alarmed at the close propinquity of the apparatus.

Sewage Disinfection.—Solution of chloralum, carbolic acid, or of some such metallic salt as sulphate of copper, should occasionally be poured into the sinks, and all other places leading to the sewer. The ash-pit, or midden, is benefited by the occasional

sprinkling of a disinfecting liquid. If there be a cistern of water devoted exclusively to the water-closet, pour into it daily a wineglassful of chloralum, or carbolic acid, solution. One pound of chloralum powder, five pounds of sulphate of iron, or one pint of carbolic acid are sufficient quantities to add to five gallons of water: if the sewers be very offensive somewhat stronger solutions may be applied; whilst for watering streets the solution may be ten times weaker.

For manure heaps and liquid manure, chlorine and chloride of lime are very unsuitable, whilst charcoal, alum, or chloralum, are suitable, applications. If the manure be quite fresh, quick-lime is a good preservative, but this substance acts unfavourably on stale manure. One pound of freshly burnt quick-lime is sufficient for 100 gallons of fresh liquid manure, and it will preserve its fertilizing qualities for a long time.

THE CONTAGIOUS DISEASES ACTS.

The opposition to the continuance of the Contagious Diseases Acts (those relating to the prevention of venereal disease) is increasing, and many medical men are writing and speaking in favour of either repealing these Acts, or of greatly modifying their provisions. The opponents of these Acts allege that they are wholly useless as a means of preventing the spread of syphilis, whilst they lead to frequent outrages on the modesty of perfectly chaste women. We rather incline to the opinion that the extension of the provisions of these Acts, so as to include the whole population of the country, would be likely to lessen the amount of syphilitic poison in circulation throughout the whole country; but whether or not the cause of morality would be at the same time promoted is not quite so clear to us. The credible evidence which has been taken relative to the practical working of these Acts certainly fails in proving that respectable women have anything to fear from them. The great question, however, is whether or not a complete system of supervision of prostitutes would be likely to diminish venereal disease. It is stated that such a system has proved an utter failure in Paris and other large cities where there are the strictest laws in relation to the control of prostitution.

In Lecour's work on Prostitution, published in 1870, he states that the total number of prostitutes registered in Paris in 1869 amounted to 3,731, whilst the number of those "in circulation," but not registered, was 2,782. In 1865 the registered prostitutes

numbered 4,225, and those known to be unchaste, but who were not registered, amounted to 3,313. It would appear that under police regime the brothels of Paris and their inmates are declining in number, whilst the population of the city has been steadily increasing. M. Le Fort, a French surgeon, who has been much occupied in organizing the system of prostitution inspection in Paris, states that he believes the actual number of women who make a " traffic of their persons " is from 40,000 to 50,000. These numbers are high, for if we assume the latter to be the true one, then it would make every fortieth female in Paris a prostitute. If, then, the venereal disease prevention laws in force in Paris fail in bringing under subversion perhaps from 70 to 90 per cent. of the " unfortunates " of that city, it may be argued would the British contagious disease laws prove more successful if they were extended to the whole population? Dr. Chapman and others assert that they would not prove more successful, and they argue that its sole effect would be to increase the amount of what has been termed " clandestine prostitution." In Dublin there is certainly a large amount of syphilitic poison present amongst the lowest class of unfortunates, and it can hardly be doubted but that the enforced surveillance of those persons would soon lessen the spread of disease. In towns of moderate size clandestine prostitution is not so difficult of detection as in such immense cities as Paris and London. Even if the Contagious Diseases Acts failed in their application to centres of large population, they might prove useful in the numerous moderate-sized and small towns of these countries.

With reference to the actual results of the Contagious Diseases Prevention Act of 1866, as applied to military and naval stations, we have the highest authority testifying to the benefits which they have received from them. In the Report of the Army Medical Department for 1869, just published, Dr. J. Graham Balfour, Deputy Inspector-General, Head of the Statistical Branch, states that the cases of syphilis (per 1,000 men) have steadily decreased since 1867 at all the stations under the operations of the Act. The following table shows the ratio of admissions of cases of primary venereal sores and of gonorrhœa respectively, per 1,000 of mean strength, at the stations under the operations of the Act, and at those to which its provisions had not been extended :—

Ratio of Admissions per 1,000 of Mean Strength.

	1867		1868		1869	
	Primary Venereal Sores	Gonorrhœa	Primary Venereal Sores	Gonorrhœa	Primary Venereal Sores	Gonorrhœa
Stations under the Act	86	131	70	129	61	108
Stations not under the Act	106	127	108	125	113	99

It is curious that there should be more cases of gonorrhœa at the stations where prostitutes are examined than at the stations where they are not. Dr. Balfour states that the Act has no effect in reducing the cases of gonorrhœa, probably owing to the difficulty of distinguishing between gonorrhœal and other vaginal discharges, and also the ease with which vaginal discharges may be concealed when the women present themselves for examination. But there is, we think, another and more general reason. If gonorrhœa be not usually detected, whilst syphilis does not elude observation, then we can readily understand that a larger proportion of syphilitic women than of women suffering from gonorrhœa being removed, the soldiers are more exposed to gonorrhœal infection than to syphilitic poison. The woman who, if there were no surveillance, might communicate syphilis to a soldier, being conveyed to hospital, another woman affected with gonorrhœa takes her place and communicates that disease. There is no doubt but that the increase of gonorrhœa at the stations under the provisions of the Act proves that the amount of syphilitic poison has been lessened.

Hong Kong was long notorious as a station where our soldiers and sailors suffered much from enthetic disease, yet we now learn that, owing to the operation of the Contagious Diseases Act of 1866, this station is rapidly becoming—so far as venereal disease is concerned—a healthy place. Dr. Murray, the Colonial Surgeon, in his Report for 1870, states that the percentage of contagious diseases to all cases of disease contracted in Hong Kong was 8·98 against nearly 18 per cent. in 1869. In the garrison the percentage of cases of primary disease to the total strength was reduced from 6·83 in 1869 to 5·51. Although a large number of British ships of war visited Hong Kong during the year, only 116 cases of

contagious disease were contracted in the colony by their crews. In the police force the ratio of contagious disease has been reduced from 16·66 in 1869 to 13·75 in 1870. The type of the disease has also undergone a favourable change, the average number of days of treatment having fallen from 24·8 to 23·1. In his Report Dr. Murray attributes the diminution of syphilis at Hong Kong to the surveillance exercised over the public women, and he says—" I may add that during an experience of sixteen years as a medical officer in all climates I have not seen a similar immunity."

SMALL-POX AND VACCINATION.

During the latter part of 1870 and the greater part of the present year small-pox was more than usually virulent in England and Wales, but it was but little felt in Ireland, where the variolous poison was repeatedly introduced from Great Britain. During the last quarter of 1870 1,229 deaths from this disease occurred in England and Wales, and during the half-year ended 30th June, 1871, the number of deaths amounted to 11,915. In London the deaths from variola during the first half of the present year numbered 5,641. The disease appears to have spread from London into the extra Metropolitan districts of Middlesex, Surrey, and Kent. From Liverpool the contagion extended to nearly all the important towns of Lancashire, including Manchester, Bolton, Salford, and Wigan. The third great centre of contagion was the coal districts of the North, especially Newcastle, Durham, Sunderland, and Stockton. The fourth distinct outbreak of the disease was in the mining districts of South Wales. There were a few other places where the disease appeared without being introduced from any of the above-named foci of infection, but the outbreaks in these cases were comparatively of little importance. Extensive districts escaped nearly altogether from the disease. In Yorkshire, with its nearly three millions of inhabitants, the deaths from small-pox during the first half of the present year were only 167. The death-rate from the disease was very high in some towns. In London, during the second quarter of the year, it was 4 per 1,000 living; in Liverpool, 6; Newcastle-upon-Tyne, 7; Sunderland, 9; Weymouth, 11; Great Grimsby, 12; in all England and Wales, 1·4 per 1,000. The epidemic is now happily fast declining. In Ireland the disease broke out in Belfast, Dublin, Drogheda, and a few other seaports subject to infection from English ports, but instead of the contagion spreading, it has hitherto died out after a

very short while. Probably this was owing to the fact that there are few unvaccinated persons in Ireland, and that vaccination is thoroughly performed. At the present moment, however, small-pox cases are becoming more frequent in Dublin. Has the endemic wave (if there be such a thing) at length reached this city?

It might reasonably have been expected that our knowledge of the etiology of small-pox and of the advantages of prophylaxis in connexion with it would have been greatly increased during the present epidemic. This expectation has not been fully realized. The statistics showing the mortality amongst vaccinated as against unvaccinated patients are by no means so abundant as we could have hoped for. This disappointment is the result of the general negligence of the great body of practitioners in not stating in their certificates of death from small-pox whether the deceased had or had not been vaccinated; and if the former was the case, whether or not the vaccine scars were imperfect. The only statistics relative to this point which we have learned are those furnished by the hospital authorities. From these we find that a large *majority* of small-pox patients admitted into hospital had been vaccinated. In order to draw a correct conclusion from this fact, we should know the relative numbers of the vaccinated and unvaccinated amongst the population. There are no reliable statistics in reference to this point. We have, however, good reason to believe that at least 20 per cent. of the people of England are unvaccinated; and if such numbers be admitted, it must be conceded that the protective influence of vaccination (as at present practised) is by no means so great as we have long been led to believe. We think this fact should be met fairly and fully by sanitarians, and, if possible, clearly accounted for. If we believe in the protective influence of vaccination, there is indeed but one way to explain the anomaly of so large a proportion of small-pox cases being post-vaccinal—namely, that vaccination is not as a general rule properly performed, nor are its virtues retained by re-performance of the operation.

The authorities of the small-pox hospitals, who so candidly admit that even so many as 87 per cent. of their patients had been vaccinated, yet show that the mortality from the disease is only from 5 to 9 per 100 amongst the vaccinated; whilst it rises to 49 per cent. amongst the unvaccinated. We further learn from this source that the mortality amongst the vaccinated who exhibit marks of perfect vaccination is so low as from 0·5 to 2 per cent.

It would appear then, that the reason why vaccination fails so frequently as a preventive of small-pox is simply because the operation is generally so imperfectly performed. It is therefore a matter of great importance that vaccinators should pay the strictest attention to the performance of this operation, and to neglect no precaution likely to ensure its success. The medical authorities in England appear to believe that there is great carelessness in vaccination, for they have issued the following code of instructions to the medical men who perform the operation by contract:—

INSTRUCTIONS FOR VACCINATORS UNDER CONTRACT.

1. Except so far as any immediate danger of small-pox may require, vaccinate only subjects who are in good health. As regards infants, ascertain that there is not any febrile state, nor any irritation of the bowels, nor any unhealthy state of skin; especially no chafing or eczema behind the ears, or in the groin, or elsewhere in folds of skin. Do not, except of necessity, vaccinate in cases where there has been recent exposure to the infection of measles or scarlatina, nor where erysipelas is prevailing in or about the place of residence.

2. In all ordinary cases of primary vaccination, if you vaccinate by separate punctures, make such punctures as will produce at least four separate good-sized vesicles, not less than half an inch from one another; or, if you vaccinate otherwise than by separate punctures, take care to produce local effects equal to those just mentioned.

3. Direct care to be taken for keeping the vesicles uninjured during their progress, and for avoiding afterwards the premature removal of the crusts.

4. Enter all cases in your register on the day when you vaccinate them, and with all particulars required in the register up to column nine inclusive. Enter the results on the day of inspection. Never enter any results which have not been inspected by yourself, or your legally qualified deputy. In cases of primary vaccination, register as "successful" only those cases in which the normal vaccine vesicle has been produced; in cases of re-vaccination, register as "successful" only those cases in which either vesicles, normal or modified, or papules surrounded by areolæ, have resulted. When the vaccination of an unsuccessful case is repeated, it should be entered as a fresh case in the register.

5. Endeavour to maintain in your district such a succession of cases as will enable you uniformly to vaccinate with liquid lymph directly from arm to arm; and do not, under ordinary circumstances, adopt any other method of vaccinating. To provide against emergencies, always have in reserve some stored lymph—either dry, as on thickly-charged ivory points, constantly well protected from damp; or liquid, according to the

method of Dr. Husband, of Edinburgh, in fine, short, uniformly capillary (not bulbed) tubes hermetically sealed at both extremities. Lymph, successfully preserved by either of these methods, may be used without definite restriction as to time; but with all stored lymph caution is necessary, lest in time it have become inert, or otherwise unfit for use. If, in order to vaccinate with recent liquid lymph, you convey it from case to case otherwise than in hermetically sealed capillary tubes, do not ever let more than eight hours intervene before it is used.

6. Consider yourself strictly responsible for the quality of whatever lymph you use or furnish for vaccination. Never either use or furnish lymph which has in it any, even the slightest, admixture of blood. In storing lymph, be careful to keep separate the charges obtained from different subjects, and to affix to each set of charges the name, or the number in your register, of the subject from whom the lymph was derived. Keep such note of all supplies of lymph which you use or furnish as will always enable you, in any case of complaint, to identify the origin of the lymph.

7. Never take lymph from cases of re-vaccination. Take lymph only from subjects who are in good health, and, as far as you can ascertain, of healthy parentage; preferring children whose families are known to you, and who have elder brothers or sisters of undoubted healthiness. Always carefully examine the subject as to any existing skin disease, and especially as to any signs of hereditary syphilis. Take lymph only from well-characterized uninjured vesicles. Take it (as may be done in all regular cases on the day-week after vaccination) at the stage when the vesicles are fully formed and plump, but when there is no perceptible commencement of areolæ. Open the vesicles with scrupulous care to avoid drawing blood. Take no lymph which, as it issues from the vesicle, is not perfectly clear and transparent, or is at all thin and watery. From such a vesicle as vaccination by puncture commonly produces, do not, under ordinary circumstances, take more lymph than will suffice for the immediate vaccination of five subjects, or for the charging of seven ivory points, or for the filling of three capillary tubes; and from larger or smaller vesicles take only in like proportion to their size. Never squeeze or drain any vesicle. Be careful never to transfer blood from the subject you vaccinate to the subject from whom you take lymph.

8. Scrupulously observe in your inspections every sign which tests the efficiency and purity of your lymph. Note any case wherein the vaccine vesicle is unduly hastened or otherwise irregular in its development, or wherein any undue local irritation arises; and if similar results ensue in other cases vaccinated with the same lymph, desist at once from employing it. Consider that your lymph ought to be changed if your cases, at the usual time of inspection on the day-week after vaccination, have not, as a rule, their vesicles entirely free from areolæ.

9. Keep in good condition the lancets or other instruments which you use for vaccinating, and do not use them for other surgical operations. When you vaccinate, have water and a napkin at your side, with which invariably to cleanse your instrument after one operation before proceeding to another.

With respect to re-vaccination, we must reiterate the opinion we have already expressed— namely, that it is almost as necessary as primary vaccination. We agree with Dr. Seaton when he says: " What a powerful means we have in the re-vaccination of adults, not merely for repairing anything which was defective in a first vaccination, but also for extinguishing the susceptibility to small-pox which may re-arise among an uncertain portion even of the well vaccinated, is now a matter of familiar observation. Marson's experience with regard to his nurses and servants has been confirmed by the experience of all the metropolitan asylums during this epidemic. Not one of their re-vaccinated inmates or *employés* has suffered ; and two or three apparent exceptions have but proved the rule, for they were in persons in whom, on one ground or another, re-vaccination had *not* been done. Re-vaccination, I need scarcely say, requires that we should bring to its performance all the care and all the pains to ensure success which are given to a primary case ; and this is almost tantamount to saying that it ought not to be left to be done at times of epidemics, and when people are under the influence of panics. What I have long endeavoured to urge as essential for complete protection is a thoroughly good vaccination in infancy, as the sheet-anchor, and a careful re-vaccination after puberty, so conducted as to give evidence that the lymph is absorbed, and repeated, if necessary, till that result is obtained. The re-vaccination should be done as systematically about sixteen years of age, as the primary vaccination is at six weeks or two months, and with this, when successful to the extent which I have stated, people may rest content."

M. Michel Levy, in an official report[a] on small-pox for the years 1865 to 1870 inclusive, shows from statistical data, the great advantages resulting from vaccination, both primary and repeated, and especially the latter.

In one of his reports to the Privy Council, Dr. Simon, whilst denying that vaccine lymph is a common medium (as asserted) for

[a] Given in extenso in Annales d'Hygiène Publique et de Médecine Légale. Paris, Avril, 1871.

the introduction of syphilitic and other poisons into the system, yet admits that a few undoubted cases have unquestionably occurred. These cases, he believes, occurred through the vaccinators having employed unclean lancets whilst introducing the lymph. It is well known that there are thousands of persons in these countries who believe that vaccination is the means of circulating a large amount of syphilitic poison, and that the operation constantly produces in healthy children scrofula, phthisis, and other diseases. Very few medical men hold these views; but there are some half dozen of qualified practitioners to be found amongst the ranks of the *vaccino-phobiacs*. That syphilis is commonly communicated to children by means of vaccine lymph is a theory utterly unsupportable; but it must be admitted that there is a *possibility* of danger of this kind *unless* the vaccinator is careful. On the 25th April, 1871, Dr. Jonathan Hutchinson read a paper on " The Communication of Syphilis by Vaccination " before a meeting of the Royal Medico-Chirurgical Society of London. The facts stated in this paper are briefly as follows:—Eleven persons, chiefly young adults out of a business establishment, were vaccinated by the lymph taken from a child of four months old, and apparently quite healthy. Every vesicle on the child's arm bled. Ten of the persons operated upon took vaccinia, which went through its normal course, the scabs falling off in three weeks. In five weeks, however, the cicatrices became enlarged and indurated, and subse-quently they became ulcerated, and were surrounded with a rash. On inquiry, the infant vaccinifer, who had looked so healthy, was found to have five small mucous patches near the anus, and her mother admitted that she had " snuffles " and a peculiar twang in crying. The mother was apparently healthy, but a suspicion of syphilis attached to the father, which he gave no opportunity of clearing up. The child's vaccination proceeded perfectly, and there was no trace of disease in the cicatrices. The two individuals who were first vaccinated had vaccinia, but no syphilis, and all the others had bad chancres. The cases stood thus:—

Vaccinia without syphilis,	-	-	-	- 2
Syphilis without vaccinia,	-	-	-	- 1
Vaccinia with syphilis,	-	-	-	- 8
				⎯⎯
				11

Mr. Hutchinson's conclusions from these facts were, that a child

in apparent health with latent syphilis may yet afford pure vaccine lymph, or may yield syphilitic poison only, or both vaccine lymph and syphilitic poison combined.

A committee appointed by the Medico-Chirurgical Society to investigate the cases of vaccino-syphilis described by Mr. Hutchinson reported the results of their inquiry on the 27th June. They confirmed the facts stated by Mr. Hutchinson, but they were not prepared to state whether the syphilitic poison was introduced by the medium of the lymph or the blood, or by both.

Cases such as those described by Mr. Hutchinson must be excessively rare, and it would be manifestly absurd to abandon our faith in vaccination because in two or three hundred thousand cases of it, one case of vaccino-syphilis might occur. It must, nevertheless, be admitted that there is a certain, though extremely slight chance of communicating syphilis by vaccination, and the public have a right to be protected from even the slightest risk of this kind. If the directions to vaccinators above given were carried out to the letter, we would hear no more of such cases as those detailed by Mr. Hutchinson.

The *Lancet*, for May 6th, 1871, in commenting upon Mr. Hutchinson's cases, expresses some doubt as to their being really syphilis. It says:—

" We are not aware that, so far, any decisive evidence has been produced that could prove the sores in question to be syphilitic. For our own part, we know of *no characters whatever* that would prove the syphilitic nature of any sore on the arm following an irritant wound, unless there were clear constitutional symptoms of syphilis. The most experienced syphilogue in the world has no right to affirm, from the mere aspect of any sore following an irritant wound, that it is syphilitic. Such sores are constantly observed, presenting the hardened base and the peculiar margin which are seen in the indurated chancre, and cicatrizing precisely in the form of the " fungoid " eminence or " bouton " which follows the true syphilitic sore ; and yet the observer knows that the primary lesion could not by any possibility have been syphilitic, and he finds that no constitutional symptoms follow it. Such was the nature, most unquestionably, of the sores produced by those unhappy vaccinations in Brittany in 1866, which caused such a terrible hubbub, and produced the disastrous debates in the Académie de Médecine. And we have been independently informed by three different London practitioners, who have been largely engaged in vaccinations during the last six months, that a comparatively common phenomenon of vaccination has been the formation of an extremely ugly-looking sore, which exactly resembled a syphilitic chancre,

both in the open and the healed state, but which (out of some score of cases) entirely and perfectly subsided without a vestige of evil result, though several months have now elapsed.	This is only a corroboration of what we ourselves have repeatedly witnessed in former days.	Now, at present, Mr. Hutchinson's cases have presented no more diagnostic phenomena than the above, *plus* a certain amount of roseola (of itself by no means distinctive) and a doubtful amount of "headache and pains in the limbs" in two or three cases.	Assuredly, something much stronger than this is needed; and we hold that the Medical and Chirurgical Society will gravely fail in its duty if it admit the syphilitic nature of these affections without a far more cogent proof."

The *Lancet* warns the Fellows of the Royal Medico-Chirurgical Society not to lightly unsettle the belief which the great majority of the people have in the efficacy of vaccination, and instances the case of Paris, where the scientific *dilletanti* frittered away the confidence of the public in vaccination, by long-winded disquisitions on a supposed epidemic of vaccino-syphilis, which proved, after all, to be a "complete mare's nest." The consequence was that vaccination was completely neglected, and small-pox has ravaged Paris in a manner that reminds one of the plagues of the middle ages.

Public attention has lately been urgently directed to the necessity of providing better hospital accommodation for patients suffering from small-pox and other contagious maladies. A minute, recently issued by the Privy Council, strongly recommends the local authorities, in the rural districts especially, to erect small hospitals solely for the treatment of contagious diseases. The provisions of the Public Health Act of 1866, enable Municipal Bodies and Boards of Poor-Law Guardians to establish hospitals for patients suffering from contagious diseases. In every village there should be a small hospital, which might, in many cases, consist of a wooden shed, or even, in summer, a tent.

Surgeon-Major Atchison has addressed several letters to the *Times*, relative to the formation of what he terms "small-pox encampments." In one of them he says—

"Take a map of London and its districts—and the same rule applies to every city, town, or village in England;—mark out the commons, waste lands, or other unenclosed spots nearest to the suburb attacked; erect a few tents, wooden huts, or roomy sheds (and at first they need not be many), place them under the charge of the district or divisional

surgeon, and thereto should be carried every variolous case of whatsoever kind, description, or class, without favour or distinction.

" Let them be near a river where there is a current of pure air, taking advantage of thatched barges or unused steamers; near the sea, or our harbours, block-ships or well-ventilated vessels at anchor— common sense directing the locality and suitability to individuals, but on no account brick or walled enclosures or pest-houses, such as we now see accumulating on every side of us, intensifying the poison, and permanently damaging the district.

" Well, the chances are a speedy recovery from a mild form, and no chance of the contamination of others. The linen could be cleaned, disinfected, or destroyed on the spot, and not carried into the town. A strict quarantine would be established, and the great disseminators of the poison, viz., the laundress, the communicative friend or relative—ay and the medical man himself unless duly careful—sedulously guarded against.

" As for the treatment for the disease, though this is hardly the place for its discussion, it is simple enough if carefully watched—plenty of fresh air, good strengthening food and wine, and scrupulous cleanliness.

" The organization of the local authorities need not be a difficult matter if once the inhabitants of an infected district saw the necessity of immediate and decisive action. The epidemic would be nipped in the bud, instead of, as now, hanging over us two or three months, a scourge to us all, and multiplying itself in a reduplicate ratio, threatening to become endemic and permanent among us, and trebly difficult to exterminate."

THE PUBLIC HEALTH AND SANITARY LEGISLATION.

Notwithstanding the many promises lately given by our Government, that sanitary measures would engage a large share of their attention, very few measures for the improvement of the public health have been passed during the last three sessions of Parliament. A Royal Sanitary Commission has indeed presented a report containing most valuable and practicable schemes for conducting public sanitary affairs in these countries, in a manner that would be certain to promote the health and longevity of the people; but we fear the Government have no intention of carrying into effect the excellent recommendation of their own Commission. The country has been ravaged by small-pox, and it is now threatened with cholera. One-third of the deaths in Great Britain occurs from preventable diseases. Surely then we have a right, and a reason too, to demand from our rulers the enactment of

a code of sanitary laws, and the institution of an adequate corps of
public health officers, as measures urgently required for the protec-
tion of the health and the lives of the people! Although the revenue
of this empire is more than seventy millions annually, the expendi-
ture, for purely sanitary purposes, is barely a few thousands
per annum. Cost what it may, a new and vigorous system of
public hygiene must be introduced into these fever-stricken
countries; and the sooner the good work of sanitary reform is set
about, the better will it be for both the rulers and the ruled. The
recently issued report of Dr. Simon contains what might be termed
a pathetic appeal to the Government on behalf of the lives and
health of the people. We cannot avoid quoting his truthful
and earnest remarks in extenso:—

"I would beg leave to represent to your Lordships that the unamended
state of those laws, especially as regards the constitution of local
authorities and the powers which they ought to have and exercise for the
prevention of disease, is not only an extreme difficulty and discouragement
to persons engaged in sanitary administration, but also involves a large
and constantly increasing waste of human life; and that since the
resources which might be utilized for the better protection of life are also
with the progress of knowledge constantly increasing, so, almost month
by month, the contrast becomes more and more glaring, between the little
which is done and the very much which with amended law might be done,
to reform the sanitary circumstances of the masses of our population.

"I believe that your Lordships will deem this matter to be, in various
points of view, deserving of the particular notice of Parliament.

"In the first place, there is the largeness of the continuing waste of
human life. It seems certain that the deaths that occur in this country
are fully a third more numerous than they would be if our existing know-
ledge of the chief causes of disease were reasonably well applied through-
out the country; that, of deaths which in this sense may be called
preventable, the average yearly number in England and Wales is now
about 120,000; and that of the 120,000 cases of preventable suffering
which thus in every year attain their final place in the death-register,
each unit represents a larger or smaller group of other cases in which
preventable disease, not ending in death, though often of far-reaching
ill-effects on life, has been suffered. And while these vast quantities of
needless animal suffering, if regarded merely as such, would be matter
for indignant human protest, it further has to be remembered, as of
legislative concern, that the physical strength of a people is an essential
and main factor of national prosperity; that disease, so far as it affects
the workers of the population, is in direct antagonism to industry; and

that disease which affects the growing and reproductive parts of a population must also in part be regarded as tending to deterioration of the race.

" Then, my Lords, there is the fact that this terrible continuing tax on human life and welfare falls with immense over-proportion upon the most helpless classes of the community : upon the poor, the ignorant, the subordinate, the immature : upon classes, which in great part through want of knowledge, and in great part because of their dependent position, cannot effectually remonstrate for themselves against the miseries thus brought upon them, and have in this circumstance the strongest of all claims on a Legislature which can justly measure, and can abate, their sufferings.

" There are also some indirect relations of the subject which seem to me scarcely less important than the direct. For, where that grievous excess of physical suffering is bred, large parts of the same soil yield, side by side with it equal evils of a another kind ; and your Lordships will often have seen illustrated in my reports, that, in some of the largest regions of insanitary influence, civilization and morals suffer almost equally with health. At the present time, when popular education (which indeed in itself would be some security for better physical conditions of human life) has its importance fully recognized by the Legislature, it may be opportune to remember that, throughout the large area to which these observations apply, education is little likely to penetrate unless with amended sanitary law, nor human life to be morally raised while physically it is so degraded and squandered.

" The above various considerations, taken together, seem to me to invest the subject which I am bringing under your Lordships' particular notice with a degree of national importance to which very few subjects can pretend. Its relative position among such subjects is not a point on which I would presume to speak. But, considering the trust which is reposed in my office with regard to this great national interest, I cannot in too strong terms express my official knowledge that it most urgently needs the attention of the Legislature. And I venture to hope and believe that your Lordships' full cognizance of the case will lead you to accord to that conclusion your authoritative sanction and furtherance."

INFLUENCE OF TEA, COFFEE, AND COCOA ON THE ANIMAL ECONOMY.

The use of tea, as an ingredient of the staple meals of the day, is steadily extending amongst the lower sections of the population, whilst the afternoon (4 o'clock) tea has recently become a recognized refreshment amongst the upper classes. It is, perhaps, doubtful

whether the well-sweetened but poor infusion of tea and the baker's bread of indifferent quality, which now constitute the morning meal in so many of the cottages of the small farmers and agricultural labourers, are so nourishing as the breakfast of porridge and milk which they have supplanted. The substitution of such articles as tea, sugar, and baker's bread for the homely articles which formerly constituted the diet of the lowest classes in the rural districts may, however, be regarded as an indication of an improvement in their condition. Although philosophers are popularly supposed to rest satisfied with the very simplest diet, it must be admitted that the skilled artisans and the brain-workers generally long, as it were instinctively, for those kinds of food which are highly nutritious and more or less stimulative. A labourer whose work is of so simple a nature that it involves almost nothing save the expenditure of mere motive power, may thrive and be thankful on his stone and a half of potatoes and half a gallon of buttermilk: but the worker who actively employs both mind and body requires something more than mere nutriment in his food; he requires it to possess flavour, high alimentative power (*i.e.*, much nutriment in small bulk), and stimulative qualities. Too frequently the stimulative properties which may be wanting in ordinary food are made up by the addition of alcohol, and it is therefore well worthy of consideration whether or not it would be desirable to encourage a general use of tea, coffee, and even cocoa amongst the labouring classes. Intemperance is the *most* fruitful source of crime and pauperism amongst the working classes, and anything that would be likely to diminish the use of alcohol amongst them would, to take the lowest ground, certainly lessen the burdens thrown upon the ratepayers, who support the prisons and workhouses.

The experiment of giving weak tea to farm labourers instead of beer has lately been tried in several districts in England, and apparently with successful results. The Chinese workmen who constantly sip tea are industrious and sober; but then, tea is cheaper in China than beer is in England. Why not reduce the duty on tea to such an extent that the poorer classes would be induced to largely consume its cheering infusion? A tea drinker is rarely a drunkard, and if the use of this beverage became general amongst the poorer classes, we have little doubt but there would be a corresponding decrease in the consumption of alcohol.

The physiological action of tea and coffee is still a *questio vexata*. According to Böcker and Lehmann these beverages increase the

action of the body, yet, at the same time, retard the decomposition of tissue—a statement which appears rather paradoxical. Dr. Edward Smith believes that tea promotes the chemico-vital functions, for directly after it is taken there is an increase in the amount of carbonic acid expired from the lungs, and there is greater freedom and depth of respiration. He believes, also, that by inducing perspiration it lessens the heat of the body. On the other hand, he thinks that coffee, although it acts favourably on the respiratory process (but to a less extent than tea), yet it lessens the functions of the skin, and promotes those of the bowels. Our own impression is that both tea and coffee act by causing (in most cases) a more perfect assimilation of food, and thus apparently, though not in reality, they retard the waste of tissue. Their action is most beneficial when taken an hour or two after dinner; then they stimulate the flagging energies of the digestive organs, and rouse the nervous system to increased activity. On one point, almost all authorities agree, and that is, that tea is best taken uncombined with milk or sugar.

In the *Comptes Rendus des Séances de l'Academie des Sciences*, No. 21, 1871, M. Robuteau describes the results of his experiments on the influence of coffee and cocoa on nutrition, and from which he arrives at the conclusion that they are not mere stimulants like alcohol, but that they directly contribute to the nourishment of tissue.

A dog which was fed daily upon 20 grammes of bread, 10 grammes of fresh butter, and 10 grammes of sugar, died in 29 days, obviously from defective nutrition; whilst a dog supplied with 20 grammes of cocoa, 10 grammes of sugar, and an infusion of 20 grammes of roasted coffee, was alive and healthy, though thin, after 29 days.

M. Robuteau states that the evil results sometimes experienced by the continued use of coffee are not felt if the coffee be properly roasted. When the coffee berries are too highly heated, an injurious substance termed caffeone is developed in them. We believe that a large proportion of the coffee used in Paris is prepared by subjecting the berries to a current of heated air or superheated steam. We wish that this kind of coffee were more frequently to be met with in these countries, for the infusion yielded by the semi-charred berries of the British grocer is often anything but a delectable beverage.

Another French *savant*, M. Charles Gazeau, has still more

recently communicated to the Academy of Sciences an account of experiments performed upon himself, the results of which appeared to show that cocoa decidedly increased the action of the heart and other vital organs. He believed, however, that the benefits derivable from its use are more apparent than real, and that it acted by merely stimulating the vital powers, by causing a more rapid destruction, or metamorphosis, of tissue. This is really the old theory as regards the action of both tea and coffee upon the animal economy. We can, however, hardly doubt the superiority of cocoa over coffee and tea as a merely nutritive principle, for its chemical composition shows that it is rich in fat-forming and muscle-making materials. It is well known, too, that in parts of South America cocoa constitutes a staple article of food amongst the Indian population.

In Liebig's *Annalen* for last May we find a paper on tea contributed by Wöller, in which great stress is laid upon the fact that the greater proportion of the nitrogen in tea is not in the form of theine, but in that of a protein substance, resembling casein, and therefore a very nutritious food.

Tea is used as a remedy for dyspepsia by the Chinese, and they have great faith in its beneficial effect upon the menstrual secretion. Dr. F. Porter Smith suggests (*Medical Times and Gazette*, 5th August, 1871) that *infusum theæ* should be placed in the British Pharmacopœia as a recognized article of the Materia Medica; but he believes that large quantities of weak tea tend to give rise to sciatica and other neuralgic affections. Mr. Lewis Thompson proposes (*Medical Times and Gazette*, 10th February, 1871) to employ theine as a tonic remedy in typhoid fever, neuralgic affections, and senile gangrene.

THE EFFECT OF A BREAD DIET ON MAN AND THE DOG.

In the *Zeitschrift für Biologie* (Band. vii. Heft. I.), G. Meyer, of Oldenberg, describes the results of his investigations relative to the effect of a bread diet on man and dogs. The experiments on dogs showed that there was great loss of nutriment when they were kept exclusively on a bread diet, as a large proportion of the albuminous constituents of the bread passed unchanged through the body. When the flour was given to the dogs in the form of cakes or dumplings, a larger portion of its constituents was assimilated than when it was eaten in the form of bread. When meat was added to the bread diet the animals were enabled to digest the

latter more perfectly—that is, they extracted more nourishment from bread when it was mixed with a little meat than when it was eaten by itself.

M. Meyer considers that an exclusively bread diet in the case of man is as wasteful as he found it to be in the case of dogs. On a purely bread diet, in which the albuminates are deficient as compared with the carbo-hydrates, the body becomes more watery, and the system is, according to Meyer, more likely to contract disease. We would suggest that this result might also be in part due to the absence of ready-formed fatty matters in the bread diet, whilst fats constitute the larger proportion of an ordinary meat diet.

Meyer made the following experiments to ascertain the effect of dieting on different kinds of bread-stuffs in the case of a healthy young man. The experiment lasted four days, during which time it was found impossible to maintain the man at his full weight, apparently because he could not digest sufficient bread, although, in order to facilitate digestion, fifty grammes of butter and two litres of beer were daily allowed. The bread-stuffs employed were the Horsford-Liebig rye-bread (we presume made from the "self-raising" flour), Munich rye-bread, white wheaten bread, and North German black bread (*pumpernickel*). The results of the experiment proved that the fine wheaten bread was by far the most digestible, whilst the other breads stood in the following order:—Horsford-Liebig bread, Pumpernickel, and Munich rye-bread. It would thus appear that it is most economical to feed people on the best quality, or, at least, on very good kinds of bread-stuffs.

PART IV.

MEDICAL MISCELLANY.

------◆------

Reports, Transactions, and Scientific Intelligence.

------◆------

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF DUBLIN.

Dr. J. Stannus Hughes, President.

Wound of an Intercostal Artery.—Dr. Mayne exhibited a recent specimen of a punctured wound of one of the intercostal arteries, and gave the following history of the case :—

John Collins was admitted into the Meath Hospital on Wednesday evening, the 8th instant, at half-past seven p.m., suffering from a stab in the chest. He was intoxicated, and did not know that he had been wounded. His shirt and trousers were completely saturated with blood from a punctured wound, internal to and on a level with the left nipple ; on introducing a probe it passed upwards and outwards for about two or three inches, but did not seem to penetrate into the thorax. He was very weak and fainted immediately on admission ; his bowels also acted involuntarily. He was placed in bed and a compress of lint applied over the wound, which stopped the bleeding externally—it was believed at the time that the wound had not penetrated. On the following morning he complained of great pain in the region of the wound, and had a short harrassing cough, with expectoration of blood mixed with mucus. His respirations were forty, and the pulse sixty-eight. On the second day all the symptoms were aggravated ; the whole left side of the chest was completely dull, both anteriorly and posteriorly, and the evidences of the existence of pleuritis were distinct. The heart was dislocated to the right side, and the dyspnœa extreme. He became gradually worse, and died on Monday evening, the 5th day after the receipt of the wound. He raved constantly for about twenty-four hours previous to death, and was in a state of drowsiness for about the same time.

On making a *post-mortem* examination, the wound was found to follow the direction indicated by the probe, but it had also passed through the

cartilage of the fourth rib, wounding the corresponding intercostal artery, penetrating both layers of the pleura, and slightly wounding the lung, the lower part of which was covered with lymph. The left pleural cavity was completely filled with uncoagulated blood, and the lung was compressed to a size somewhat larger than the closed hand. The pericardium was uninjured.—*February* 18, 1871.

Cirrhosis of the Liver.—DR. EAMES exhibited a specimen of cirrhosis of the liver, which had been taken from the body of a man who died in Mercer's Hospital on the 22nd of the present month. He was admitted to the hospital on the 14th of January. He was an old pensioner, and had seen much service in India. He had been for many years addicted to drinking raw spirits; and in India he took arrack and whatever came to his hand in the way of stimulants. At that time he suffered very much from piles. He came home, was discharged from the army, and went to work in the garden of a nobleman in the country. In the mornings he had no appetite, and could not eat anything until he had a preliminary glass of raw whiskey, which probably involved one or two on the previous evening. He became ill, and was sent by his employer to the hospital, where he was admitted on the 14th of January. At that time his abdomen was enormously distended by fluid. It presented all the physical signs of fluid in the peritoneal sac. There was also considerable splenic enlargement. He was treated by diuretics and diaphoretics without any good effect. He passed but a small quantity of urine, and this was dense, loaded with lithates, but contained no albumen. The abdomen was thirty-six inches in circumference round the umbilicus. His appetite became very bad. He could not retain any food on the stomach, vomiting almost immediately after each meal. After various medicinal means had been tried without reducing the amount of fluid in the peritoneal sac, it was decided to tap him. His colleague, Mr. Morgan, performed the operation, using a very fine capillary trochar, connected with the pneumatic aspirator. He drew off a large quantity of fluid; but the abdomen filled up very rapidly again. The tapping was repeated from time to time; and it was remarkable that as the tappings went on, the area of splenic dulness contracted, being distinctly reduced after each operation. The *post-mortem* examination, which was made rather hurriedly, in consequence of objections raised by the relatives, revealed the following state of things. The liver presented a very well-marked specimen of cirrhosis, the usual yellowish colour, and on section enormous fibrous thickening. The capsule was adherent, and there was old peritonitis. The walls of the stomach were dense and thickened, the capacity of the organ being considerably diminished. The spleen was not so large as it had been, and presented a somewhat shrivelled appearance.—*February* 25, 1871.

Carnified Liver.—Dr. Eames also exhibited a liver which was removed from the body of a man who had died on Thursday evening last in the hospital. He had been in Mercer's Hospital about seven or eight months ago, under his (Mr. Eames') care, for one day, when he was laid up, and obliged to go off duty. He was then under the care of his friend, Dr. Mason, but he had no account of the patient's condition at that time. Being anxious to try change of air, he applied to a neighbouring hospital, where he was kindly received, and he (Dr. Eames) was indebted to the physician under whose care he was when there for the notes of his condition at that time, which he would now lay before the Society. He was admitted to the Adelaide Hospital on the 9th of December. His history, as then taken, was that three years ago he had suffered from immensely swollen feet. Six months afterwards he passed urine the colour of porter, and small in quantity. The thighs and scrotum were enormously swollen. He was a man of intemperate habits. Every three or four weeks he suffered from a pain in the stomach, which lasted for a day, and ended in the vomiting of a dark fluid. He also suffered from headache and epistaxis, had cough, and his tongue was habitually furred. He had nausea and vomiting after taking fluid. The bowels were regular. the pulse 80 in the minute. What was remarkable was the enormous quantity of urine which he passed, 120 ounces in the twenty-four hours, of a specific gravity of 110; it contained broken tube casts and epithelium. The amount of albumen was very considerable. Under treatment his condition slightly improved. The epigastric uneasiness ceased. His feet were still swollen, and the amount of urine not diminished; it was 149 ounces, and the specific gravity 108 at this time. On the 11th of February he (Dr. Eames) was going round the hospital with Dr. Little, who asked him to readmit the patient to Mercer's Hospital, which he did. When he got out, he was afforded an opportunity of indulging in his former habits, and he went off, and had what is technically called a " batter." He came into hospital in the evening with headache, pain in the back, and great epigastric uneasiness. His urine very quickly diminished in amount. On the second day it was only 30 ounces, specific gravity 112; pulse 140; the tongue the colour of mahogany. He had great thirst, but nothing remained on his stomach. He was delirious, and rapidly sank. He became comatose, and died on Thursday evening. At the autopsy the kidneys were found to be smaller than natural. They weighed 3½ ounces each. They were dense, hard, and the capsule so exceedingly adherent that in tearing it off it brought a part of the structure of the kidney with it. The medullary portion had not suffered to the same extent as the cortical portion. The kidneys were paler than natural, and wanted some of the appearances that were usual in cirrhosed

kidney. He accordingly tested the kidney for amyloid degeneration; and on the application of *Liquor Iodi* it gave that peculiar staining, the mahogany tinge, characteristic of amyloid disease. The spleen was dense and very hard, had a fleshy feel, but was not enlarged. The liver was very much thickened in its whole structure, very hard, dense, and, if he might borrow a word from Professor Smith, carnified in its structure, like the spleen. The liver weighed 45 ounces.—*February* 25, 1871.

PROCEEDINGS OF THE DUBLIN OBSTETRICAL SOCIETY.

THIRTY-SECOND SESSION.

Dr. Kidd, President.

Dr. Atthill read a paper on *Some Forms of Menorrhagia.*—He observed that there was not any symptom of uterine disease of more frequent occurrence, of greater gravity, or which causes more alarm to the patient than menorrhagia. It depends for its origin on such a variety of causes, local and constitutional, that the exercise of great caution is necessary as to diagnosis and to treatment. In the present communication, Dr. Atthill confined himself to the consideration of the treatment most suitable to cases of menorrhagia when occurring in connexion with, or dependent upon, sub-involution of the uterus, on granular ulceration of the cervix, or on an unhealthy condition of the mucous membrane being the body of the uterus.

Dr. Atthill regards defective involution of the uterus after labour or abortion, as a prominent cause of excessive menstruation. When sub-involution exists, an undue amount of blood is present in the organ, and the relaxed condition of the uterine tissue favours its exudation, therefore, when the periodic determination of blood to the uterus takes place, as occurs at each menstrual period, the moderate flow which should relieve that congestion becomes a profuse discharge, and often an exhausting drain. The mischief does not end here, for the abnormal state of the uterus in cases of sub-involution predisposes to granular ulceration of the os and cervix uteri, in which the mucous membrane of the cervical canal becomes oftentimes everted to a considerable extent, as well as hypertrophied and exceedingly vascular, a condition which increases the previously existing tendency to hæmorrhage. Thus, in not a few cases, we find these two causes present in the same patient. The following was quoted as an example of this:—

Mrs. F., the mother of twelve children, a woman aged forty-eight, presented herself a year previously at the dispensary of the Adelaide Hospital. She stated that ever since her last confinement, five years
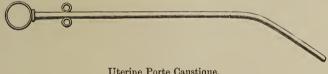
ago, menstruation had gradually become more profuse, the flow continuing for a longer period than usual, the intervals between the periods being correspondingly shortened. During the intervals she suffered from profuse leucorrhœa, and, as a result of this incessant drain, had become greatly debilitated. On examining the uterus the sound passed to the depth of three inches and a half. The os uteri was patulous; there was extensive ulceration of the os uteri; and on separating the lips, the mucous membrane lining the cervical canal was found to be thickened and highly vascular. This was a case requiring active treatment, which could not be adopted as long as the patient followed her ordinary occupation. She was accordingly admitted into hospital. Dr. Atthill at first proceeded to make an exploration of the uterine cavity, by dilating the cerfical canal and os internum. This was effected by the introduction of several pieces of sea-tangle bougies. This enabled him to decide that there was not any polypus or fibrous tumour in the uterus. The inner surface of the uterus was then cauterized freely with the strong nitric acid, the application of which did not cause any pain. The patient was kept in bed for three or four days subsequently as a measure of precaution. On examining her after the lapse of a week, the condition of the ulceration which existed round the lips of the os was found to have improved considerably, and she was discharged in a short time perfectly cured.

In the foregoing case sub-involution was regarded as manifestly the primary cause of the menorrhagia, the ulceration being altogether secondary. In many cases, however, sub-involution exists alone, or, on the other hand ulceration may exist alone, either condition being fully sufficient to give origin to the menorrhagia. The following case is an example of the former :—

F. L., aged twenty-four, married about a year, was a delicate young woman of lymphatic temperament. Menstruation had always been profuse, especially if she took walking exercise or exerted herself during the flow. She became pregnant after the occurrence of the second menstrual period following her marriage, but having imprudently taken a long and fatiguing walk, she aborted about the eighth week; two subsequent menstrual periods were so profuse as to reduce her to a state of extreme debility. Ergot, gallic acid, &c., failed to do good. On examining her after the termination of these periods, the uterus proved to be considerably elongated, the sound passing to the depth of three inches and a half; there did not exist any ulceration. The history of the case being altogether against the supposition of the existence of polypus, Dr. Atthill came to the conclusion that the menorrhagia depended on sub-involution. In fact that the uterus had never regained its normal size and tone, since the miscarriage, which had occurred two months previously. He therefore determined to carry out a plan of treatment, the value of which he has repeatedly tested, namely, the introduction

up to the fundus of the uterus of ten grains of the solid nitrate of silver, leaving it to dissolve there. This was accordingly done in this case. The application produced considerable pain, but no further unpleasant results followed. She was confined to bed for several days afterwards, but then allowed to go about. Menstruation appeared at the regular time and was moderate in quantity. This patient became pregnant immediately afterwards.

Dr. Atthill regards this case as a well marked illustration of the occurrence of sub-involution as a result of abortion—a fact which he considers is overlooked by many; next as showing the dangerous menorrhagia which may depend on this condition of the uterus; and, thirdly, as proving the excellent results which follows the treatment adopted. Ergot, gallic acid, and, indeed, all other medicines will fail to check menorrhagia depending on sub-involution; and we must have recourse to treatment directed to the uterus itself; we must stimulate the organ to set up that healthy action by which it regains its normal size after pregnancy has terminated—a process to which Sir J. Simpson has applied the term "involution." With this view Dr. Atthill unhesitatingly advocates the adoption of the treatment practised in the preceding case, and asserts that he knows no other so efficacious. The mode of carrying it out is simple. The instrument known as Sir James Simpson's "*uterine porte caustique*" is introduced into the uterus just as an ordinary uterine sound.

Uterine Porte Caustique.

This little instrument consists of a hollow silver tube, in size and shape closely resembling a sound. It contains a flexible stilette which it fits accurately. As soon as its point is found to have reached the fundus of the uterus, the stilette is withdrawn, and through the instrument is pushed up, by means of the stilette, a piece of solid nitrate of silver reduced to the requisite size and weight, till it is fairly lodged in the cavity of the uterus. The precaution must be taken, however, of withdrawing the instrument to the extent of half an inch, as soon as the piece of nitrate of silver reaches the extremity of the *porte caustique*, and before it is finally pushed out of the instrument, a point of which we can always be certain by observing how much of the stilette remains still unintroduced; if this precaution be not observed, it is possible that the nitrate of silver might be forced into the substance of the uterine wall, instead of being left free in its cavity, an accident which, though possible, is very unlikely to occur. Dr. Atthill has practised this treatment for several

years, and he believes that it is safe and simple. He does not say that it is always sufficient, and that a cure must always result; but in his hands it has been productive of marked success, and in no single instance has he known of its producing serious symptoms. The application of solid nitrate of silver to the interior of the uterus is by no means a novel practice. Dr. Evory Kennedy used to introduce it into the cavity of the body of the womb by means of an ordinary female catheter several years ago, but he did not leave it there to dissolve. To Sir J. Simpson we are indebted for the further development of the practice, and for the invention of the *porte caustique*. Dr. Atthill believes that Dr. Kidd was the first of the Irish obstetricians who adopted his practice.

Menorrhagia resulting from ulceration of the os and cervix uteri is also of frequent occurrence. Mere abrasion up the os uteri is not sufficient to produce menorrhagia; but that unhealthy spongy condition of the os and cervix, in which the mucous membrane lining its canal becomes hypertrophied and thickened, and bleeds on the slightest touch, the os being patulous and the lips everted, is quite capable of originating severe menorrhagia.

Mrs. B., a young married woman, aged twenty-four, who had never been pregnant, stated that she had become greatly debilitated by the excessive loss which occurred at each monthly period. Ergot and astringents were exhibited by the mouth, and astringent lotions injected into the vagina without producing the least effect. The use of the speculum proved the existence of extensive granular ulceration of the os and cervix uteri. In such severe cases, the ulceration extends at least as high as the os internum, and we will fail to effect a cure unless our treatment reach every portion of the diseased tissue; therefore with the view of permitting the necessary applications to be made to the whole of the extent of the cervical canal, in this case two tents of compressed sea-tangle were introduced, the object being to dilate the cervix to an extent sufficient to allow of his treating the entire extent of the cervical canal. He left these pieces of the sea-tangle *in situ* for twenty-four hours, and on withdrawing them after the lapse of that time, cauterized freely the whole diseased surface with fuming nitric acid. This did not cause any pain. On examining the os uteri a few days subsequently he found it in a much healthier state. *The menorrhagia was entirely checked and never returned;* and although a considerable time elapsed before the uterus regained a healthy state, still the progress of the cure was rapid and the cure perfect; the only treatment subsequently necessary being the occasional application of a twenty grain solution of nitrate of silver to the os uteri, and at a later period, of a small blister to the sacrum; finally, not the slightest trace remained of the ulceration, and menstruation became in all respects normal.

Dr. Atthill states that in cases of granular ulceration of the os and cervix uteri, of course it is not always necessary to dilate the cervix uteri If the case be recent, and if we can satisfy ourselves that the ulceration does not extend very high, the use of the solid nitrate of silver, of zinc points, or brushing the parts lightly over with nitric acid, may be sufficient, but in the graver forms of the disease the only effectual treatment will be that just advocated. Dr. Atthill believes that not a little of the opprobrium which rests on obstetric practitioners from the length of time over which this treatment extends is due to excessive timidity, and to the use of inefficient remedies. The case above related was an example of so-called granular ulceration of the mucous membrane of the os and interior of the cervix uteri. Properly speaking, however, there is no true ulceration in this case. On the contrary, the mucous membrane is thickened and hypertrophied, its surface being covered with numerous papillæ, which, from the resemblance they present to ordinary healthy granulations, have given origin to the term "granular ulceration." These are not new growths, however, being merely enlargements of the ordinary papillæ which have, under the influence of disease, become enlarged and vascular, and bleed on the slightest touch. This condition is, by most writers, spoken of as never extending beyond the os internum; it does not do so generally, but Dr. Atthill has no doubt whatever that the same condition which we see in the cervical canal, also not unfrequently exists within the cavity of the uterus, and is the result of causes similar to those which originated it in the former situation. If we meet with a case of menorrhagia in an otherwise healthy woman, which a careful vaginal examination proves not to depend on granular ulceration of the os or cervix, or on sub-involution, it is our manifest duty, continues the author, to dilate the cervix and os internum, with the view of determining what the condition of the interior of the body of the organ may be. As a rule the uterus is seldom in such cases much elongated, the increase being not more than to the extent of perhaps half an inch. This point is of importance in enabling us to decide as to the possible presence of an intra-uterine tumour; but the existence of these or of the condition under consideration can only be solved by dilating the cervix, and then passing the finger fairly up to the fundus of the uterus. It is surprising how little the patient suffers from this process, and how rapidly the os regains its natural size. Not less remarkable is the entire absence of all unpleasant symptoms after a proceeding apparently so severe; and he has not the least hesitation in recommending the practice.

For dilating the cervix he has quite given up the use of sponge tents, and invariably adopts the plan recommended by Dr. Kidd of introducing a number of pieces of sea-tangle bougies. If the cervix be rigid three or four pieces will be as many as can be safely inserted; but if it be relaxed, double, or even treble, that number may be with impunity inserted. If

the smaller number be used they should be withdrawn after the lapse of a few hours, and a larger number inserted; but in my case the os internum must be dilated to a size sufficient to admit the top of the index finger to pass through.   To effect this by no means easy matter, the first step after withdrawing the sea-tangle is to seize the anterior lip with a vulsellum, and with it to draw the uterus well down.   This should be done by an assistant; pressure being at the same time made on the fundus; by these means the uterus will have been brought so low, that unless the pelvis be very deep the point of the finger will reach the very fundus, and we are enabled to discover the presence of even a very small polypus, should it exist, or to detect the rough uneven feel of a granular condition of the mucous membrane, which Dr. Atthill regards as a frequent cause of menorrhagia.   This condition he considers the result of subacute inflammation or congestion of the mucous membrane.   In order to effect a cure it is necessary to destroy the so-called granulation, and to endeavour to excite a healthy action in the diseased part.   With this view, he employs the strong nitric acid, which he applies freely to the entire of the inner surface of the uterus, by means of a bit of lint fastened to a proper holder.   In this proceeding the os should be brought into view by the duck-bill speculum, and while the anterior lip is drawn down by the vulsellum he passes the stick armed with the lint dipped in nitric acid through the os internum, and sweeps it freely but rapidly round the interior of the uterus.   Another piece of lint soaked in water is then passed up to the os, to protect the vagina from any acid discharge from the os uteri, and the vulsellum and speculum being withdrawn, the patient is left in bed for some days, absolute rest being required.   With due attention to these precautions no ill effects need be dreaded.   The communication concluded with the details of cases treated in this manner.

Menorrhagia of Six Years' Duration, depending on an Intramural Tumour of the Anterior Wall of Uterus, treated by the application of strong Nitric Acid—Recovery.   By HENRY GOGARTY, F.R.C.S.I.—On the 7th of April, 1870, I was sent for to see Mrs. E., who was reported to be suffering from a considerable loss of blood.   On my arrival at her home, I found her almost pulseless, perfectly anæmic, nearly unable to articulate, and deluged in blood.   She complained of noise in the ears, giddiness, and swimming in her head, and dimness of vision.

My first impression was that she had aborted, and that some of the secundines remained in the cervix or os uteri, giving rise to the profuse hæmorrhage.   However, subsequent inquiry and examination convinced me that such was not the case.

She being unable, from exhaustion, to give me any further account of herself, I directed my efforts to arrest the bleeding and restore her

strength. This I succeeded in accomplishing, in a few days, by the administration of stimulants, nutrition, gallic acid and opium, with small doses of liquor extract of ergot in glycerine (a preparation introduced by Dr. Long, of the firm of Hamilton, Long, & Co., Sackville-street, and which I have found to be more certain in its effects, and much less likely to nauseate than the ordinary extractum ergotæ liquidii of the pharmacopœia). Her history is as follows :—

Mrs. E., age 42, always enjoyed good health up to six years ago. She married at 35, and conceived six months later. She went on in good health until the middle of the sixth month of pregnancy, when, without any apparent cause she aborted, and made but a poor recovery. From this time she dates her ill health. She noticed that the catamenia came regularly, but remained with her longer than usual. A few months later, the quantity increased. Still, her general health did not suffer much. Soon afterwards, the flow became more profuse ; but she attributed this to the circumstance of her husband having returned from the Mediterranean and living constantly with her. Two months after his return, she found her strength beginning to fail, complained of weakness, amounting to faintness, lassitude, and want of energy. At length she consulted a physician, who prescribed astringents, in various forms, together with rest in the recumbent position, nourishment, &c. This treatment was continued, with varying degrees of success, for the space of four years, the last three of which she was scarcely ever free of bloody discharge.

She now resolved to give up doctors, as she benefited nothing by medicine, and was informed by a midwife that, probably, her change of life was at hand, and all would be well when menstruation ceased. The unction of this old woman's comforting words was not destined to remain long with her, for the arrival of an American lady (a relative of her husband, furnished with speculum, continuous vaginal syringe, and sundry " pacquets" of French simple astringent powders for injecting the vagina) blasted the soothing influence instilled into her mind by the elderly female, and cast her again on the troubled waters of doubt and fear.

Soon the paraphernalia were got in readiness, and many a quart of fluid was injected into the vagina, but to no purpose, for still the blood it came. A week after the departure of this modern matron of the new world, I first saw her, in the condition before depicted.

A fortnight after my first visit her strength had so much improved that I made up my mind to explore the uterus, and ascertain its exact dimensions, and the extent of its cavity. I placed her in the simiprone position, recommended by Dr. Marion Sims, and with his duckbill speculum, and the assistance of an intelligent woman, I found the os externum healthy, and slightly opened, a small stream of blood flowing from it. The cervix was considerably elongated, the cavity measuring

five and a half inches. When the sound reached the os internum, I experienced some difficulty in getting it beyond that point, and had to resort to various inclinations of its axis to overcome this barrier. She was next put in the lithotomy position, and with the greatest facility, by the bi-manual manipulation, I ascertained that the body was enlarged, the anterior wall was more convex and thickened than the normal uterus.

Having thus satisfied myself of the enlargement, I suspected the existence of a tumour, and felt that it was necessary to dilate the cavity, in order to learn if such existed, its nature, and to apply remedial measures, if expedient. This I accomplished by the gradual introduction of sea-tangle tents. On the fifth day I had inserted seven tents of the size of No. 6 bougie. When those were fully expanded by the evening of the same day, the uterus was fairly open, and admitted freely two fingers. On examining the interior, I discovered a medium-sized intramural tumour, situated in the anterior wall, reaching from the os internum to the fundus.

The information now obtained perplexed me not a little, for I was at a loss to know what to do, under the circumstance.

I returned five of the tents, together with a fresh one, and resolved to wait the morrow, to deliberate on what was best and safest to be done. The mucous membrane covering the tumour, and, indeed, all the mucous lining of the uterus, was intensely vascular, the slightest exertion or excitement causing it to bleed freely. To let my patient drain to death was a serious reflection ; but what could I do ? The idea of gouging the tumour, as recommended by Mr. Baker Brown, presented itself to my mind ; but, as I had no experience of it, I did not like to hazard her life by so formidable an operation.

The next idea which struck me was the injection of the uterine cavity with compound tincture of iodine, as practised by Dr. Savage. This proceeding I feared, for I have considerable experience of the serious inflammation it sets up when employed as an injection into the tunica vaginalis, for the radical cure of hydrocele.

A short time before this case came under my care, I read in one of the journals an article on the application of strong nitric acid to the internal surface of the uterus, for the removal of sessile growth from its wall. I had witnessed its beneficial effects in the practices of my friends Doctors Kidd and Roe, at the Coombe Hospital. Thus encouraged by experience, and fortified by the knowledge that if it did not succeed, at least it would do no harm, I resolved next day to apply it freely to the tumour in hope it might shrink it, or arrest its development towards the uterine cavity. With the aid of Mr. Wyer, who examined the case, and kindly assisted me in taking charge of the speculum and vulcellum, having previously anointed the vagina with lard, I mopped the tumour freely and over its whole extent with the acid, had her put to bed, and ordered

a full opiate. Next morning, she stated she had slept well, had had no pain or bleeding, and felt very comfortable. She remained without change for three days. On the fourth day. a slight sanious discharge appeared ; yet there was no pain or other disturbance. On the fifth day, the discharge increased with slight fœtor. She was ordered to be syringed with a weak tepid solution of Condy's permanganate of potass. Sixth day. discharge more abundant and more fœtid ; had a good night, pulse better, and desired food. I placed a tampon of cotton, saturated with glycerine, in the vagina, and ordered ten grains of chlorate of potass with bark, to be taken every third hour. The glycerine increased the discharge very much, but quite removed the smell. On the eighth day, she complained of stinging pains in the lower part of abdomen. The discharge, about the same in quantity, became redder. I examined her with the speculum, and found protruding from the os a membrane which I cautiously withdrew with a pile forceps. This proved to be a complete caste of the uterine face of the tumour, formed of the mucous lining of the uterus, which was denuded by the acid. From this date the discharge gradually diminished, and left her perfectly free on the thirteenth day after the operation. Sixteen days later, she menstruated, the catamenia lasting four days, being healthy in quantity and quality. She was removed to Dalkey for change of air, and ordered iron and quinine. She has never had a bad symptom since : has gained three stone in weight, is stout and florid, and can attend, with ease and comfort, to her household duties.

I saw her in March of this year. She was then well, strong, and cheerful.

I thought, Sir, that the details of this case would not be uninteresting to the members of this Society, the more so on account of the interest evinced in the etiology, pathology, and treatment of uterine fibroids by nearly all the leading gynæcologists in Great Britain and America at the present time. I am also desirous to elicit the opinions of our members as to their experience of medicinal agents given by the mouth, and acting through the general circulation, on those growths, as much has been said, both for and against, by the highest authorities here and in the sister countries.—*May* 13, 1871.

1. On bone-setting (so called), and its relation to the treatment of joints crippled by injury, rheumatism, inflammation, &c., &c. By Wharton P. Hood, M.D., M.R.C.S. London and New York: Macmillan and Co. 1871. Fcap. 8vo, pp. 156.

2. Puerperal Temperatures. By William Squire, L.R.C.P., Lond. London: J. and A. Churchill. 1871. Sewed.

3. Die "Exacten" deutschen Ohrenärzte. Von Dr. W. Kramer, Gcheimer Sanitätsrath. Berlin: Georg Reimer. 1871. Sewed.

4. The physiological action and therapeutic use of chloral. By Dr. J. B. Andrews, M.D., Assistant Physician New York State Lunatic Ayslum. Sewed.

5. The articles and preparations of the British Pharmacopœia, pointed according to their relative values, designed to aid in the study of the Materia Medica. By Alexander Harvey, M.D., Professor of Materia Medica in the University of Aberdeen; and Alexander Dyce Davidson, M.D., Assistant Professor. Aberdeen: Arthur King and Co. 1871. Sewed.

6. On syphilitic epilepsy. By Reuben A. Vance, M.D., Attending Physician for Diseases of the Nervous System, at the out-door department of Bellevue Hospital. New York: F. W. Christern. 1871. Sewed.

7. Gleig's school series: animal physiology. By E. D. Mapother, M.D., Professor of Physiology Royal College of Surgeons, Dublin. London: Longmans, Green, and Co. 1871. Pp. 131

8. Recueil des Travaux de la Société Médicale d'Observation de Paris. Seconde Série. Tome Second. 2e Fascicule. Paris: J. B. Baillière et Fils.

9. A biennial retrospect of medicine, surgery, and their allied sciences for 1869-70. Edited by Mr. H. Power, Dr. Shepherd, Mr. Waren Tay, Mr R. B. Carter, Dr. Barnes, and Dr. T. Stevenson, for the New Sydenham Society. 1871.

10. A treatise on physiology and hygiene for educational institutions and general readers. By Joseph C. Hutchison, M.D., President of the New York Pathological Society, &c., &c. New York: Clark and Maynard. 1871. Fcap. 8vo, pp. 270.

11. The use of the laryngoscope in diseases of the throat, with an appendix on rhinoscopy. By Morell Mackenzie, M.D., London, M.R.C.P., Physician to the Hospital for the Diseases of the Throat. Third edition. London: Longmans, Green, and Co. 1871. 8vo, pp. 174.

12. The physiological anatomy and physiology of man. By Robert B. Todd, William Bowman, and Lionel S. Beale. A new edition by the last-named author. Part II. of Vol. I. London: Longmans, Green, Reader, and Dyer. 1871. 8vo, pp. 306.

13. The West Riding Lunatic Asylum Medical Reports. Edited by J. Crichton Browne, M.D., F.R.S.E. Vol. I. London: J. and A. Churchill. 1871. 8vo, pp. 265.

14. A manual of the laws affecting medical men. By Robert George Glenn, LL.B. London: J. and A. Churchill. 1871. 8vo, pp. 460.

15. The Spiritualist.

16. Sull' ultimo stadio del cholera Asiatica. Memoria del Prof. Filipo Pacini. Firenze: Tipografia Italiana N. Martine. 1871. Sewed.

17. Phrenology and how to use it in analysing character. By Nicholas Morgan. London: Longmans, Green. and Co. 1871. 8vo, pp. 364

18. On the relative powers of various substances in preventing the generation of animalculæ. By John Dougall, M.D., Glasgow. London: J. and A. Churchill. Sewed.

19. Some simple sanitary precautions against cholera and diarrhœa. By M. A. B. London H. K. Lewis. Sewed.

20. Disinfectants, and how to use them. By Edward T. Wilson, M.B., Oxon., F.R.C.P. H. K. Lewis.

21. A handy book on food and diet, in health and disease. By Charles A.

Cameron. Ph. D., M.D., Professor of
Hygiene in the Royal College of Surgeons,
&c. Cassell, Petter, and Galpin. 1871.
Small 8vo, pp. 96.

22. A system of medicine. Edited by
J. Russell Reynolds, M.D., F.R.S., Pro-
fessor of Medicine in University Col-
lege. Volume the third, containing local
diseases (continued). London and New
York : Macmillan and Co. 1871. 8vo,
pp. 995.

23. Report on the sanitary state of
Kells. By Richard J. Halton, L.K. and
Q.C P.I., &c., &c. Sewed.

24. The glykogenic function of the
liver. By James Tyson, M.D. Sewed.

25. Epidemic cholera. By Edward
Ambrose Fitzgerald, Surgeon Bengal
Medical Service. London : J. and A.
Churchill. 1871. Sewed.

26. A new operation for bony anchy-
losis of the hip-joint, with malformation
of the limb. By William Adams, F.R.C.S.,
Surgeon to the Royal Orthopœdic and
Great Northern Hospital. J. and A.
Churchill. 1871. Pp. 68.

27. Notizen und Erinnerungen eines
Ambulanz-Chirurgen. Von William Mac-
Cormac, wundarzt am St. Thomas Hos-
pitale in London. Aus dem Englishen
übersetzt und mit bemerkungen versehen
von Dr. Louis Stromeyer. Hanover :
Hahn'sche Hofbuchhandlung. 1871.

28. Onderzoekingen gedaan in het phy-
siologisch laboratorium der Utrechtoche
Hoogeschool Uitgegeven door F. C.
Donders en Th. W. Engelmann. Utrecht:
W. F. Dannenfelser. 1871.

29. Thirteenth report of the Medical
Officer of the Privy Council ; with appen-
dix. 1870.

30. Journal of the Scottish Meteoro-
logical Society.

31. On the use of the ophthalmoscope
in diseases of the nervous system and of
the kidneys, also in certain other general
disorders. By T. Clifford Allbutt, M.A.,
M.D., Cantab., Physician to Leeds Gene-
ral Infirmary. London and New York :
Macmillan and Co. 1871. 8vo, pp. 405.

32. Clinical lectures on diseases pecu-
liar to women. By Lombe Atthill, M.D.,
Univ. Dub., Fellow and Examiner in
Midwifery King and Queen's College of
Physicians, Obstetric Physician to the
Adelaide Hospital, and formerly Assist-
ant Physician to the Rotunda Lying-in
Hospital. Dublin: Fannin and Co. 1871.
Fcap. 8vo, pp 211.

33. Fistula, hœmorrhoids, painful ulcer,
stricture, prolapsus, and other diseases
of the rectum. By Willam Allingham,
F.R.C.S., Eng., Surgeon to St. Mark's

Hospital for Fistula, &c. London : J.
and A. Churchill. 1871. 8vo, pp. 239.

34. Transactions of the Clinical Society
of London. Volume the fourth. London:
Longmans, Green, and Co. 8vo, pp. 200.

35. The skim-milk treatment of diabetes
and Bright's disease. By Arthur Scott
Donkin, M.D., Lectnres on Medical Juris-
prudence and Toxicology in the University
of Durham. London : Longmans, Green
and Co. 1871. 8vo, pp. 317.

36. Lectures on the principles and prac-
tice of physic, delivered at King's College,
London. By Sir Thomas Watson, Bart.,
M.D., F.R.S., Physician in ordinary to
the Queen, late President of the Royal
College of Physicians, &c. 2 volumes.
The fifth edition, revised and enlarged.
London : Longmans, Green, and Co.
1871. 8vo, pp. 910 and 1,070.

37. Mysteries of the vital element in
connexion with dreams, sonambulism,
trance, vital photography, faith and
will, anæsthesia, nervous congestion and
creative function. By Robert H. Col-
leyer, M.D. Second edition. Henry
Renshaw. London. 1871. 8vo, pp. 144.

38. A complete history of the case of the
Welsh fasting girl (Sarah Jacob), with
comments thereon, and observations on
death from starvation. By Robert Fowler,
M.D., Edin., Vice-President Hunterian
Society, &c. London : Henry Renshaw.
1871. 8vo, pp. 307.

39. An introduction to pathology and
morbid anatomy. By T. Henry Green,
M.D., Lond., Lecturer on Pathology and
Morbid Anatomy at Charing Cross Hos-
pital Medical School. London : Henry
Renshaw. 1871. Fcap. 8vo, pp. 304.

40. Pulmonary consumption; its nature,
varieties and treatment, with an analysis
of one thousand cases. By C. J. B. Wil-
liams, M.D., F.R.S., and Charles Theodore
Williams, , M.A., M.D., Oxon., Fellow
Royal College of Physicians, Physician to
the Hospital for Consumption, Brompton.
London : Longmans Green, and Co.
1871. 8vo, pp. 402.

41. Archives of ophthalmology and
otology. Edited and published simultane-
ously in English and German. By Prof.
H. Knapp, M.D., in New York, and
Prof. S. Moss, M.D., in Heidelberg. Vol.
I., Nos. 1 and 2. Vol. II., No. 1. New
York : William Wood and Co.

42. Lectures on clinical medicine, deli-
vered at the Hôtel Dieu, Paris. By A.
Trousseau. Volume fourth. Translated by
John Rose Cormac, M.D., Edin. and
Paris, F.R S.E. The New Sydenham
Society. 1871. 8vo, pp. 470.